LECTURES

ON

THE MORBID ANATOMY

OF THE

SEROUS AND MUCOUS MEMBRANES.

IN TWO VOLUMES.

BY

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&c. &c.

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VOL. I.

ON THE SEROUS MEMBRANES;

AND, AS APPENDED SUBJECTS,

PARASITICAL ANIMALS, MALIGNANT ADVENTITIOUS STRUCTURES,
AND THE INDICATIONS AFFORDED BY COLOUR.

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M DCCC XXXVI.

TO

WILLIAM STROUD, M.D.

IN TOKEN OF SINCERE REGARD,

THE RESULT OF LONG AND PROVED FRIENDSHIP;

AND AS A MARK OF UNFEIGNED RESPECT

FOR HIS ACQUIREMENTS,

AS A LEARNED, EXPERIENCED, AND ABLE PHYSICIAN,

AS WELL AS FOR HIS EXEMPLARY VIRTUES

AS A MAN AND A CHRISTIAN;

THIS VOLUME

IS INSCRIBED BY

THE AUTHOR.

PREFACE.

I⊤ may be thought that a new work on Morbid Anatomy, especially if it do not comprise the whole field of this extensive subject, is a superfluous addition to the numerous productions of the Medical Press. It may be said, that the writings of Baillie, of Bright, of Carswell, and of Craigie, in this country; with those of Andral and of Louis, which are extensively known, both in their original form and in translation; and the splendid fasciculi of Professor Cruveilhier, in addition to his publication of the valuable Lectures of Dupuytren; constitute an ample fund of pathological writings. It may be objected, that, in addition to these, the systems and monographs which have appeared in France, Germany, and Italy, and which are more or less known, either in their original form or as the bases of articles in Reviews and Encyclopædias, already comprise a larger amount of literature on this subject than medical men, whether students or practitioners, find it convenient either to purchase or to peruse. I admit the objection—having felt its weight: yet other reasons have operated, with counteracting force, to induce me to lay the following pages before the public. At the time when I commenced the study of the medical profession, a strong bias in favour of the pursuits of Pathological Anatomy not only influenced my course of study in London and Edinburgh, but prepared me to receive, with peculiar interest, the instructions and demonstrations of Laennec, at the Hôpital Necker, and of Rostan, at the Salpêtrière; as

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well as to witness the numerous inspections at the Hôpital
de la Charité, which were at that time principally per-
formed by Professor Andral, then a student, and laboriously
engaged in collecting the mass of valuable facts which he
has since published in his *Clinique Médicale*.   These ad-
vantages, with others of less moment, subsequently enjoyed
in Italy and elsewhere, may be mentioned as circumstances
which led me to undertake, with peculiar interest, the office
of inspector of the dead at Guy's Hospital; together with
the charge of the Museum, which, though small and limited
at that period, had recently received a powerful stimulus to
its increase in the separation which had just been con-
cluded between the Borough Schools.

The making of several hundred inspections necessarily
brought under my notice a great variety of appearances in
most of the organs of the body.   The results of them all
being, with few exceptions, recorded with more or less
minuteness, and the specimens being in many instances
either preserved or faithfully delineated, greatly facilitated
the comparison of morbid appearances with each other.
The simultaneous formation of the Museum not only called
for and facilitated this comparison, and compelled me to
turn my attention to a systematic classification, but also
brought under my notice rare and interesting specimens,
presented to our Museum by those whose liberality
prompted them to add to our collection.   I had, at one
time, contemplated drawing some statistical conclusions from
these accumulated details: but, in addition to other insu-
perable difficulties, the fact, that the cases examined and
recorded formed but a very small proportion of the pa-
tients admitted into the hospital, precluded the possibility
of arriving with any degree of accuracy at the conclusions
which I was desirous of obtaining.   I was not at that time
acquainted with the mode in which Louis was conducting

his labours; which have not only surpassed any thing which I had contemplated, but must cause him to be held in lasting remembrance, as one of the most laborious cultivators of the medical profession : whilst, in establishing the numerical method, so admirably calculated both to elicit truth and discard error, he has placed himself amongst its greatest benefactors. Although the first and main incentives to post-mortem inspection, namely, the elucidation of symptoms and the confirmation or correction of diagnosis, have always been kept in view, it has also been a prominent object, as an important part of inquiry especially connected with the interests of the Museum, to investigate morbid appearances in relation to each other, and with reference to the commencement, progress, and ultimate results of particular modes of derangement. Such a course could only be taken by the help of General Anatomy, in seeking to become acquainted with the changes of particular structures, and in analysing the derangements of those organs which possess a compound structure. In this country, Morbid Anatomy had not been made the subject of a regular Course of Lectures; but had been taught incidentally, in the Lectures on Special Anatomy, Surgery, and Medicine. In the Session of 1827, I began to lecture on this subject; and, for the reasons stated in the Introductory Lecture, I selected the Serous Membranes. The following year, I was engaged with the Serous Membranes, Parasitical Animals, the diseases called Malignant, and the Mucous Membranes. Although, in different seasons, some other subjects have also been taken up; such as, the Cellular Membrane, Bone, and the Heart and Vascular Systems, I have invariably found that the important objects first enumerated have unavoidably occupied the best part of the course. I have therefore felt disposed to yield to the suggestion of some of my friends, who have been led,
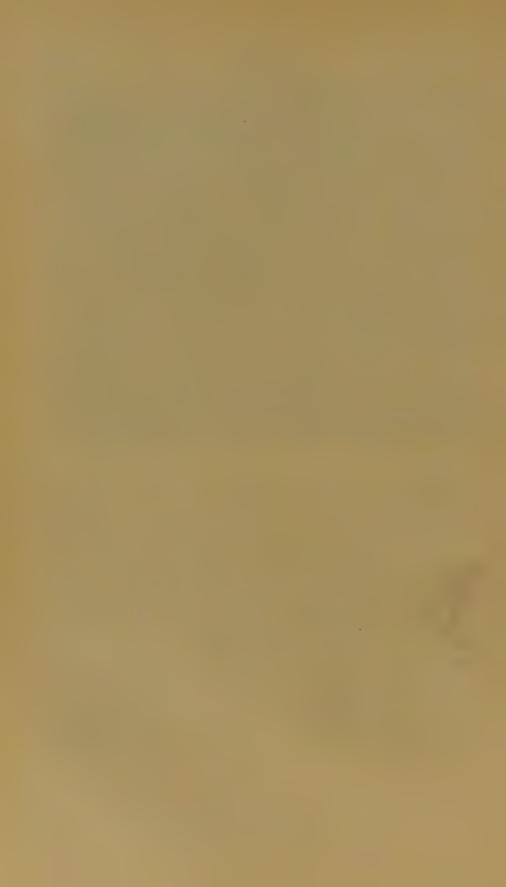
by their kind and favourable opinion, to recommend the
publication of the Lectures. By this means, I shall, at
least, be enabled to present to the Students of the School of
Guy's Hospital those views with which it is essential that
they should be made acquainted, in order to comprehend
the Lectures which, in continuation of the subject, I hope
to deliver on other tissues and organs. From the number
and variety of my engagements, I should scarcely, however,
have been able to accomplish, and probably should not
have undertaken, the publication of this series of Lectures,
had it not been for the kind and valuable assistance of my
excellent and accomplished friend, John Blackburn; who
took upon himself the arduous task, both of revising the
manuscript, which was in the hand-writing of different
amanuenses, and also of directing and correcting the press.
Amongst other advantages, for which the reader is indebted
to him, must be mentioned the marginal indices, which
cannot fail greatly to facilitate reference to the subjects
treated of.

At the close of the Volume will be found a few Cases,
selected by way of illustration of some of the subjects
mentioned in the Lectures. I have likewise referred
to a few of the Preparations in the Museum; and to some
of the Plates which have been published by Sir Astley
Cooper, Dr. Bright, Dr. Carswell, and Professor Cruveil-
hier. I trust that these learned authors will regard this
procedure as an act rather of respect than of plagiarism;
and that the reader will find himself indemnified by it,
for the omission of Plates which would have seriously in-
creased the expense of the work, and thus frustrated one
of my objects in publishing it. It is also desirable that the
reader should refer to the Catalogue of the Museum of
Guy's Hospital; which may be regarded as bearing the
same relation to a system of Morbid Anatomy that the

Flora of a district does to a system of Botany. Although
it is not to be understood that the collection contains speci-
mens of every known morbid alteration of texture, never-
theless there are, comparatively, few which it does not
exemplify : and, as these specimens are arranged on the
same principles as have been adopted in the Lectures, an
acquaintance with the Catalogue, especially if conjoined
with the examination of the specimens in the Museum, will
afford a tolerably good idea of the mode in which the
principles are applied to the classification of other textures
and organs. In the course of my Lectures and Demon-
strations, appearances have been noticed, and some opinions
have been offered, which I believe to have been undescribed
and new : some of these have been since published by
others. Such occurrences can scarcely fail to take place,
in the progress of the investigation of truth : and I feel
somewhat indemnified for an apparent loss of originality, in
the confirmation of the exactness of my observations.

C.ONTENTS.

LECT. I.

INTRODUCTORY LECTURE.

LECT. II.

ON THE SEROUS MEMBRANES.

LECT. III.

ON THE SEROUS MEMBRANES.

THE ARACHNOID.

LECT. IV.

ON THE SEROUS MEMBRANES.

THE PERICARDIUM.

LECT. V.

ON THE SEROUS MEMBRANES.

THE PLEURA.

LECT. VI.

ON THE SEROUS MEMBRANES.

THE PERITONEUM. TUNICA VAGINALIS. BURSÆ.

LECT. VII.

ON PARASITIC ANIMALS.

LECT. VIII.

ADVENTITIOUS SEROUS MEMBRANES.

LECT. IX.

GENERAL CHARACTERS OF MALIGNANT DISEASE.

LECT. X.

ON MALIGNANT DISEASE.

SCIRRHOUS AND FUNGOID TUMORS.

Distinction between classes of Malignant Growths.—On the charac-
ters, structure, and size of Scirrhous Tumors.—Lesion of parts
adjacent to Scirrhous Tumors—Ulceration of Scirrhous Tumors—
Scirrhus does not degenerate into Fungoid Disease.—Spontaneous
and Artificial Cures of Scirrhus—On the Uterine Tumors termed
Scirrhous—Nomenclature of Fungoid Disease—Points of contrast
between Scirrhous and Fungoid Disease—Vascularity of Fungoid
Disease—Solid portions of this formation—Evidences of Cystiform
structure in Fungoid Tumors.—Phænomena of Osteosarcoma—
Affection of surrounding structures in Fungoid Disease—on Gela-

LECT. XI.

ON THE COLOURS OF ANIMAL TISSUES.

LECT. XII.

ON MALIGNANT DISEASE.

NOTES AND CASES.

CORRIGENDA.

Page 88, l. 17, for *granulated* read *annulated.*
— 143, in the second marginal reference, for *Poltore* read *Poulton.*
— 147, l. 7, from the bottom, and in the margin, for *secretions* read *accretions.*
— 201, the part of the second paragraph commencing with, " They have marginal pores," and ending with " cucurbitini," is out of place; and belongs to p. 198, where it should conclude the first paragraph on Tænia solium.
— 212, l. 19, for *contractor* read *constrictor.*
— 213, l. 8, from the bottom, for *classed* read *has classed.*
— 219, l. 5, from the bottom, for *demands* read *demand.*

LECTURES

ON

PATHOLOGICAL ANATOMY.

LECTURE I.

IMPORTANCE OF MORBID ANATOMY—THE STUDY OF IT NECESSARY TO THE
CONSCIENTIOUS AND SKILFUL PRACTITIONER — OBSERVATION OF SYMPTOMS
AND STUDY OF SPECIAL ANATOMY NOT SUFFICIENT TO CONSTITUTE A PATHO-
LOGIST.—ASSISTANCE RENDERED BY MORBID ANATOMY TO PHYSIOLOGY—
RISE AND PROGRESS OF MORBID ANATOMY— ITS CULTIVATION AMONG THE
GREEKS AND ROMANS — REVIVAL OF MEDICAL SCIENCE IN THE ITALIAN
STATES—LABOURS OF BARTHOLIN, BONETUS, MOROAGNI, LIEUTAUD, LUD-
WIG, SANDIFORT, BAILLIE, PORTAL, VOIGTEL, CORVISART AND HIS DISCIPLES.
—RECENT RAPID ADVANCE OF THE SCIENCE, AND ITS CAUSES : 1. THE STUDY
OF GENERAL ANATOMY. 2. THE BROUSSAIEN CONTROVERSY — RESEARCHES
OF LOUIS, AND OUTLINE OF THE NUMERICAL METHOD. — PLAN OF THE PRE-
SENT COURSE — GENERAL ANATOMY THE BEST BASIS — DIVISION OF THE
BODY INTO TISSUES, RATHER THAN INTO REGIONS—SELECTION OF SEROUS
AND MUCOUS MEMBRANES.—ARRANGEMENT OF TOPICS—ABNORMAL STATES
CONSISTING IN DEFICIENCY—IN EXCESS—IN FORM—IN THE RESULTS OF IN-
FLAMMATION—IN THE RESULTS OF SCROFULA—IN MALIGNANT DISEASE—
IN THE PRESENCE OF HYDATIDS—IN THE EFFECTS OF ACCIDENTAL INJURY.—
INDICATION OF THE BEST WRITTEN SOURCES OF INFORMATION—CONCLUSION.

GENTLEMEN,

I⟀ may be thought surprising, that, in delivering a
Lecture introductory to the subject of Pathological Ana-
tomy, I should feel the necessity of urging the pursuit of
an object which not only presents so many points of self-
evident importance to excite your zealous attention, but is
increasingly recommended to you, both by precept, in the
Regulations of the Apothecary's Company, of which some of
you are ambitious to become members, and, still more for-
cibly, by the bright example of those who, in this and in

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other countries, have raised themselves to well-merited
distinction by the successful cultivation of medical science.

To those who may place the *summum bonum* of medical
practice in converting the largest quantity of physic into
gold, morbid anatomy must, I am aware, be an object of
disgust, rather than of attraction; but those who are aspi-
ring to become the worthy members of a profession which
has for its object the restoration of health to our suffering
fellow-creatures, and of which it has been said, in the words

Import..nce
of Morbid
Anatomy.

of Cicero, " Homines ad deos nullâ re propiùs accedunt,
quàm salutem hominibus dando," must see, that morbid
anatomy, or the investigation of those physical derange-
ments which, as the consequences of disease or accident, it
is their business to avert or remove, constitutes a study the
most essential to their art. Sydenham has, not without
justice, been reproached with vanity, for declaring that
there was no disease, which, if completely made known to
him, the resources of his art would not enable him to cure:
but, whilst I could almost sanction this preposterous confi-
dence, as a powerful stimulus to the complete investigation
of morbid changes, I can see no palliative for the presump-
tion of those who profess to administer the remedy, even
without the knowledge of the disease. Amongst such a
class, however, must those be placed, who are regardless of
morbid anatomy.

It would be a gross mistake to suppose that the most ex-
tensive acquaintance with nosological terms, combined with
all the knowledge that written or oral instruction is able to
convey, is sufficient to give that acquaintance with disease,
which can duly qualify for the application of curative means,
or that it will carry us forward towards that ideal perfec-
tion described in the declaration of Sydenham. I cannot
but admire the remark of Hogarth, when he says, that those
" students who confine their studies to the works of the
" dead, need never hope to live themselves." The spirit of
it is as applicable to our art, as to his. We can only

become properly initiated into our profession by personal
acquaintance with disease, founded on our own patient
investigation at the bed-side of the sick, and by a diligent
examination of the effects of disease, as brought to light
by cadaveric inspection. The practice of examining the
dead, for the purpose of ascertaining the seat and effect of
disease, is absolutely necessary to complete those ideas
which it is impossible for the best verbal descriptions per-
fectly to convey: and it is also necessary, as the means of
detecting that which yet remains to be either wholly disco-
vered or more fully elucidated.

Although it may be highly attractive to have in view the
prospect of adding to the general stock of knowledge in
our profession, and on this account may be more particu-
larly desirable to inspect the bodies of those who have died
under rare and singular affections, it is no less important, All Cases
both for students and those actually engaged in practice, to ought to be
examined.
seek every opportunity of making or witnessing *post-mortem*
inspections, even in those cases which may be regarded
as of ordinary occurrence. It is only by this practice that
the student can learn to distinguish the almost endless
varieties of aspect which parts and organs assume; and to
avoid confounding three things, essentially distinct—healthy,
diseased, and cadaveric appearances: and to him who is
engaged in practice, it is no less necessary, in order to
keep up his knowledge, and to rectify, confirm, and im-
prove his diagnosis. I do not hesitate to assert, that it is
as necessary for the medical practitioner to appeal to this
only certain test, as it is for the merchant to keep and
balance his accounts. I do not deny, that many, who have
neglected this practice, have exercised their profession suc-
cessfully, not only as respects the improvement of their own
fortunes, but also the relief of their patients; yet I cannot
help regarding such success, as resembling that of a fortu-
nate gamester, rather than of a steady and sure merchant.
It is true that we cannot be called to account by the

patients who die under our hands, as those who are engaged
in commerce may be summoned to make a statement of
their affairs; yet conscience, and that interest in his profes-
sion, and for his patients, which every medical man ought
to feel, should stand in the place of incessantly importunate
creditors.

Knowledge
of Morbid
Anatomy
sometimes
publicly
tested.

There are, moreover, occasions on which medical men, in
spite of indifference on the points which I have mentioned,
are unavoidably called upon to give public proof of that
knowledge which is only to be obtained by the enlightened
examination of the dead. It is from the very great and
general neglect of the important study of pathological
anatomy that so large a portion of the accounts of inspec-
tions, whether made for judicial purposes or to gratify cu-
riosity in rare and remarkable cases, are so extremely im-
perfect, that nearly all we can say of them is, that one is
more vague than another.

Good spe-
cial Anato-
mists not
necessarily
Patholo-
gists.

It may be thought incredible, but I am persuaded of the
fact, that this remark is applicable to many inspections per-
formed by those who are justly entitled to be considered
good anatomists. This is the natural consequence of what
appears to be the prevailing opinion amongst students, in this
city at least; viz. that the perfection of anatomical know-
ledge consists in a minute acquaintance with special or
descriptive anatomy, to the almost total neglect of general
anatomy, or that division of the subject which teaches the
peculiarities of structure in the healthy state, and which is
consequently most intimately connected with pathological
anatomy. The special anatomist may give us a minute
account of the wound of an arterial ramification, or an ac-
curate description of a partial dislocation : he may describe
the exact direction which the fracture of a bone has taken
between its foramina and processes, the muscles which the
fractured extremities have lacerated, the ligaments torn
through, and the nerves divided or pressed upon. In all
this, there may be much display of anatomical knowledge—

and, I would also say, much useful and important information, in reference to those cases in which surgical assistance can avail; but I repeat, that the most accurate special anatomical knowledge is, singly, inadequate to throw light on very many of the effects of disease.

Besides the more obvious importance which morbid anatomy possesses, as one of the most essential elements of sound pathology, and as the indispensable guide to, and test of diagnosis, it derives a great degree of importance and interest from the light which it may throw upon the nature and progress of those processes which are continually going on in living organized bodies, and which present an almost endless variety, dependent on the structure or tissue of the parts in which they take place, on the age of the individual in whose body they are performed, and on the varieties of disease by which he may be generally or locally affected. In these processes, and the changes to which they give rise, the ultimate elementary molecules of which the animal structures are composed, are principally concerned : they have therefore been sometimes called ' molecular changes.' From their very nature, they are necessarily of difficult investigation ; since they must often have made considerable progress before they become strikingly evident to our senses. These processes have been generally comprehended under the term ' actions'; and when the effect has become manifest in any organ or tissue, it is said, that the action of the part is altered — that a new action has been set up. Now, I particularly wish to caution you against receiving this as an explanation : it is, in fact, only a substitution of terms ; something like saying that the striking of the clock is the result of a sonorific power. Sometimes, it is true, a hypothetical explanation is attempted, by modifying the preceding expressions, and saying, the action *of the vessels* of the part is altered. We are, however, so much in the dark as to the *modus operandi* of the minute capillaries, both in health and disease, that if

Assistance of Morbid Anatomy in the study of Physiology.

we attach any definite idea to the expression, '*altered action of the capillaries of a part,*' we must be indebted for it to imagination, rather than to demonstration. Though I am very far from having the arrogance to suppose that I shall be able to explain these mysterious processes, yet I wish to call your attention to them, in a point of view in which some of you may not have hitherto contemplated them. They are, in fact, the operations of living animal chemistry; and are, consequently, processes which we can neither imitate by art, nor, by the most careful observation, closely watch, and follow, during their progress. We may, indeed, when examining some of the lowest forms of animal life, by the help of very powerful microscopes, perceive the processes of deposition and absorption going forward; the one forming, the other removing, the most delicate organs: and I assure you that I can scarcely conceive a more intensely interesting spectacle than that which my friend Joseph Jackson Lister exhibited to me, when he placed a living zoophyte in the field of his admirable microscope. This highly interesting exhibition, which will probably lead to curious and important physiological discoveries, will not, at present at least, afford us much assistance in the investigation of those processes to which I have been alluding. It is to morbid anatomy that we must look for our chief assistance in this investigation. The changes which disease effects in our different structures and organs, may be regarded as experiments in animal chemistry, performed for us by nature herself; and, although we cannot watch these experiments in their continued progress, the death of the individuals, or the removal of the affected parts, may enable us to view their progress in all its stages, and to connect them together as a whole. With this view, morbid appearances, which may be regarded as trivial, either in themselves, or from their being situated in parts of little moment, as respects treatment, sometimes acquire a new and important interest. I beg of you to bear this in mind, when I may

hereafter lay before you, as connecting links, morbid appearances which you may regard as, otherwise, undeserving attention.

You must not, however, suppose that I wish unduly to raise the importance of pathological anatomy; although to it—and to *it* alone—we are indebted for much that has been rescued from the domain of conjecture in our profession. It must be confessed, that there are many points, which morbid anatomy never has explained, and probably never can explain. Still it affords some assistance towards our better acquaintance with these, by enabling us to detach the class to which it is applicable, from that which calls for other modes of investigation. *Morbid Anatomy does not elucidate all diseases.*

I am very far from urging the commencing student to devote that time to the study of morbid anatomy, which he ought to spend in the acquirement of many branches, which, as preliminaries, are of greater importance; but I wish to impress on your minds, that *that* medical education must be miserably defective, which is terminated without this essential branch having been cultivated. I do not doubt, but that those who have been much longer acquainted with our profession than myself, will fully confirm the uniform result of my own observation, that the most assiduous and successful pupils, as well as the most zealous and enlightened practitioners, have ever been distinguished by the pains which they have taken to increase their familiarity with morbid anatomy. *Morbid Anatomy not suitable for the commencing Student.*

Although the Fathers of Medicine have left but little on record respecting morbid anatomy, it is not possible that so interesting and attractive a subject could have been lost sight of, or neglected, by them. Amongst the ancient Egyptians, those who, whether as priests or physicians, had to perform the office of embalming the dead, must have had innumerable opportunities of becoming acquainted with morbid anatomy. From the Egyptians it is highly probable that Hippocrates derived many ideas, not only *Egyptians, Greeks, and Romans.*

respecting our internal structure, but also respecting the alterations produced by disease; for, although he has not given us the detail of inspections, it is evident, from many of the terms which he has employed, that he was not wholly unacquainted with the morbid affections of internal parts. When, at a later period, living individuals were given up for the purposes of anatomical and physiological research, it can hardly be supposed that the bodies of those already dead from natural causes were not often devoted to the same purpose; thereby affording to the examiners the means of observing the causes from which disease and death had proceeded. We know, indeed, on the authority of Celsus, that this was actually the case; and whilst he justly reprobates the barbarous acts to which I have alluded, and points out their inexpediency, he at the same time advocates the advantage of the inspection of the dead.

I shall not further take up your time with the inquiry into the state of *morbid* anatomy amongst the Greeks and Romans: nor do I think it necessary to hunt for the feeble traces of its dormant existence amongst those Saracenic hordes, who, during the middle ages, spread themselves over the south of Europe, bearing on their standards, in the figure of a waning moon, the emblem of their dim light, compared with the brightness of the day which was preparing to dawn.

Dawn of modern Medical Science in Italy.

The revival of letters commenced in Italy. With the other sciences, medicine was introduced by the fugitives from Constantinople, amongst the descendants of those who had formerly received it from Asclepiades and Themison. In the flourishing Republics of Italy, and also in the States of the Church, there quickly arose numerous and indefatigable anatomists, who enriched their science by important discoveries, and, by the fame of their lectures, attracted from various parts of Europe those who were the most ardent in the pursuit of knowledge. Such were Eustachius, Fallopius, Fabricius of Aquapendente, Asillius, Vesalius, and

Veslingius.   By the labours of these men, and of others
who followed their example, in the different countries of
Europe, many valuable contributions were made to patho-
logical as well as descriptive anatomy.

It does not however appear that any distinct treatise
had been written on the subject of *morbid anatomy* until
the year 1674, when Thomas Bartholin, a Dane, published
a work, entitled *Consilium de Anatomiâ Practicâ, ex Cada-
veribus Morbosis adornandâ.*   This was quickly followed by
the celebrated *Sepulchretum, sive Anatomia Practica*, of
Theophilus Bonetus, a physician of Geneva ; respecting
whom it has been said, " egregie, si quis alius, meritus est."
He has given us, in an anatomical order, the result of his own
careful observations, during forty years ; together with a
laborious collection from the works of his predecessors and
contemporaries.   From this time, the writings of most prac-
tical medical authors, whether physicians or surgeons, are
enriched by cases, in which the detail and description of
morbid appearances form some of the most interesting
features.

I have next to mention one of the most illustrious indi-
viduals on the list of morbid anatomists, J. B. Morgagni,
whose work *De Causis et Sedibus Morborum, per Anato-
men investigatis*, justly styled, by Dr. Baillie, " stupendous,"
is indeed one of the most remarkable and valuable monu-
ments of our art.   His cases are well chosen, and exposed
with order and clearness : and his work, the first that can
be regarded as any thing like a complete treatise on *patho-
logical anatomy*, is an almost inexhaustible store of valuable
facts ; to which most succeeding writers on this subject
have constantly had recourse, and which justly entitles him to
be regarded as, in some sort, the Father of morbid anatomy.
By his example, not less than by his lectures and writings,
he has stimulated and directed the zealous researches of
those who have endeavoured to extend the only firm and
legitimate basis of true pathology, by discovering the seat

Pathologi-
cal Works
of Bartho-
lin,

Bonetus,

Morgagni,

of disease, and the nature of its action, as evinced by the
changes which it has effected in the organization of parts.
This great man seems also to have been destined by na-
ture to furnish the best refutation of the arguments of
those who neglect the opportunities of cadaveric inspection
on the plea, that life and health are endangered by the dili-
gent prosecution of these researches. He was one of the
most striking exceptions to that received opinion, as to the
shortness of the life of medical men, which has given occa-
sion to the observation, " *Aliis inserviendo consumuntur,
aliis medendo moriuntur.*" In the enjoyment of corporeal
vigour, and retaining unabated the energies of his mental
powers, *Morgagni* continued, to his 90th year, not only to
enrich the world by his labours as an author, but to deliver
lectures to the undiminished interest of his audience.

Lieutaud,   I must not pass over in silence the merits of Lieutand,
who, though disparaged by Cullen, was no mean contributor
to the progress of pathology. In his " *Historia Anatomico-
Medica, sistens numerosissima cadaverum humanorum ex-
tispicia, quibus in apricum venit genuina morborum sedes,
horumque reserantur causæ, vel patent effectus,*" although
he has borrowed considerably from Bonetus and Mor-
gagni, he has also added numerous facts, and many obser-
vations, from his own experience. His work has this great
merit, that his descriptions of morbid appearances are
always accompanied by an account of the previous symp-
toms. That very minuteness, with respect both to the
symptoms and *post-mortem* appearances, which has drawn
down upon its author the censure of Dr. Cullen, attaches
to the Historia Anatomico-Medica of Lieutaud, as a work
of reference, an intrinsic value, which neither the lapse
of time nor the changing fashions of medical doctrine can
destroy. Having said this, I have said all that I shall at-
tempt to say in favour of Lieutaud; who, when his merits
had raised him to be the first physician to the Court of
France, still devoted his time to the advancement of his

profession. I shall leave his arrangement, his pathological opinions, and his prescriptions, to the censure of his illustrious Edinburgh reviewer.

That minute anatomist Ludwig, better known by his elaborate work on the nerves, published his First Lines of Pathological Anatomy, accompanied with copious references, in 1783. About the same period, Professor Sandifort, who enjoyed, at Leyden, the benefit of having the united Museums of Raaus and Albinus to refer to, gave to the world his " *Observationes Anatomico-pathologicæ*," and his splendid " *Museum Anatomicum.*" Ludwig, Sandifort,

In this country, a treatise on pathological anatomy seemed to have been long a desideratum, when the opprobrium of this deficiency was removed by the appearance of a work, which, whether we regard the high estimation which it soon commanded both at home and abroad, or the honour and success which it obtained for its author, is perhaps second to none which the medical literature of modern times has produced. The *Morbid Anatomy* of Dr. Baillie—for years confessed, even by our rivals, to be the most complete treatise of the kind which had ever appeared—soon received the homage of translation, in France, Germany, and Italy. It contains, in a condensed form, a view of all the morbid appearances which had been observed up to the time of its publication, with short notices of the symptoms dependent on most of them. The works of Portal in France, and of Voigtel in Germany, though published some years later than the Morbid Anatomy of Dr. Baillie, and though considerably more minute, have not obtained an equal degree of reputation. Far be it from me to detract from the merit of our justly celebrated countryman, or to underrate the valuable contribution, which, in the publication of his great work, he has made to medical science; but, whilst I am ready to subscribe to the remark of Rothe, that no physician ought to be without this book, and, from my own experience, do not hesitate to state, that, even now, we are acquainted Baillie, Portal, and Voigtel.

with, comparatively, few morbid appearances which have not been seen and described by Dr. Baillie, I cannot help observing, that in his description of these appearances we may look in vain for that minuteness of detail which is essential to a work destined to teach pathological anatomy. This defect is rather to be ascribed to the condensed form which the author has adopted, and to the comparatively little attention which previously to his time had been paid to *General Anatomy*, than to any deficiency in his abilities or opportunities.

Recent rapid progress of Morbid Anatomy. Causes thereof.

Cultivation of General Anatomy.

There is perhaps no branch of medical knowledge, in which greater advances have been made, in the few last years, than in that of morbid anatomy. Two causes have mainly operated in the production of this favourable change. The first of these was the special cultivation of *General Anatomy*, the outlines of which were faintly sketched by Dr. Carmichael Smith. The higher praise, however, is due to the great Bichat; who, while he seems to have possessed the merit of originality equally with Dr. Smith, has pursued the subject into its minutest details; so as to leave little to his successors, but the introduction of a few slight modifications and divisions.

This indirect, but very important, service to the cause of pathological anatomy was not the only one which it received from Bichat. One of his last labours was the delivery of a course of lectures on *Morbid* Anatomy, of which he made his *General Anatomy* the basis. On the same basis, Pinel laid the outlines of his *Nosographie Philo-*

Disciples of Corvisart.

sophique; and the numerous individuals of superior talent, who were fortunately brought together in the Clinical School of Corvisart—amongst whom, Bayle, Laennec, and Rostan must be specially noticed—following up the same plan, have made most important advances in this department. I shall not attempt to particularize their merits; since I shall, in the course of these Lectures, often have occasion to speak of their labours.

The second cause, to which I ascribe the remarkable ad- vance recently made by pathological anatomy, is the forma- tion of a new medical sect, which has arrogantly assumed to itself the peculiar title of Physiological ; and, whilst it has too exclusively sought to localize every disease to which we are liable, and to refer to one common cause every devia- tion from the healthy structure, has boasted the possession of the first and only medical doctrine which has been raised on the sure basis of anatomy. Broussais, the author of the *Phlegmasies Chroniques*, the unquestionably talented, but enthusiastic and conceited founder of this sect, has long drawn around him, and attached to his doctrine, many of the most zealous and intelligent pupils of the French Me- dical School. These individuals, and also the opponents of the sect and its author, have sought their proofs and refu- tations in the inspection of the bodies of the dead. *Morbid anatomy* has hence been pursued with a zeal and minute- ness altogether unprecedented. The labourers have been repaid by a vast collection of valuable, interesting and im- portant facts; and very many excellent monographs have been produced, in illustration of the pathology of almost every tissue and organ.

I cannot conclude this brief historical sketch without paying a tribute of respect to one of the most diligent la- bourers for the advancement of medical science that modern times have produced. When I call your attention to the name of Louis, I do so for the double purpose of setting before you the laudable example of a physician who has signalized himself by the zeal and indefatigable perseverance with which he has pursued his well-directed inquiries, and of describing to you his peculiar method of investigation, which is regarded by some as marking an era in the science of pathology, similar to that which the invention of Fluxions has created in Mathematics.

Professor Louis had already gone through the regular course of medical study, and had been for some time

engaged in the actual practice of his profession, when doubts
respecting many generally-received medical opinions, and
dissatisfaction with the mode of reasoning by which these
opinions had been formed, induced him to lay aside practice,
and to devote his whole time, and all his faculties, in the full
vigour of the prime of life, to the most minute personal
examination of disease, as it presents itself to actual obser-
vation.   With this view, he confined his attention to one or
more large wards in a general hospital in Paris. He made
a minute and daily record of *all* the Cases there collected :
taking care to find out, and to note, every particular con-
nected with the previous history of the patient, which could
in any way affect or complicate the existing malady.   When
the cases terminated fatally, he was equally particular in re-
cording all the appearances observed in the inspection of
the body ; not confining himself to those appearances which
might be supposed to be connected with the last illness, nor
even leaving the integrity of an organ to be inferred from
its being passed over in silence, but taking care expressly
to record the fact.   These histories he afterwards subjected
to a minute tabular analysis, bringing together all those
cases which belonged to a particular form of disease ; and
the tables, thus formed, he submitted to a still more minute
tabular analysis.   By this purely statistical method, it is
obvious, that he precluded the possibility of being led astray
by preconceived hypotheses ; and that he avoided the dan-
ger of overlooking those coincidences which, under an or-
dinary review, might have escaped notice, from the attention
being drawn to phænomena of more striking character, but
far less general, or even accidental.

   Some idea of the scrupulous anxiety which actuated
Louis, in drawing his conclusions from these tables, may be
formed from the fact, that he rejected all those cases which
he recorded during the first six or eight months after he
commenced this course of investigation, considering that
his powers of observation and description were not suffi-

ciently cultivated to furnish the elements of that severe and
rigorous deduction which it was his object to make.   You
will easily perceive, that the method of Louis affords the
most salutary check to those ardent and enthusiastic ge-
niuses whose fertile imaginations readily produce beautiful
and captivating theories; which, when adorned by brilliant
language and vivid illustrations, have been ever apt to ac-
quire an extensive but temporary influence over medical
science, the legitimate progress of which they have most
seriously impeded.   I will not pretend that the method of
Louis is altogether new and original : the mode of analysis
which he adopts, is clearly exhibited and recommended in
the " Organon Medicum " of my friend Dr. Todd.   Statisti-
cal medical tables have indeed long been constructed ; but,
in respect of accuracy, minuteness, and comprehensive pur-
pose, they will not bear to be named, in comparison with
those of Louis.

Trusting that you are convinced of the importance of the
subject which is to occupy your attention, and are willing
to follow the example of those eminent men whose labours
I have briefly sketched, I shall proceed to point out the   Plan of the
plan of the Course of Lectures which I propose to deliver.   present
                                                             Course.
I have hitherto considered, and I now see no reason to
change my opinion, that the best arrangement for a course   Arrange-
of morbid anatomy is that which is founded on general   ment found-
                                                         ed on Gene-
anatomy.   It is only by collecting into one view the various   ral Anatomy.
alterations which disease effects in any particular tissue,
that we can hope to arrive at an accurate knowledge of the
relation which these modifications bear to each other, and
to the healthy state.   We may compare these with the mo-
difications belonging to other tissues ; and not only draw
important conclusions in reference to practice, but hope,
sooner or later, to obtain some little insight into the nature
of some of the most important healthy as well as diseased
actions.   Instead, therefore, of dividing the body into re-
gions, and enumerating the changes which may take place

in the organs situated within fixed boundaries, I shall bring
under your notice the morbid alterations of certain per-
vading tissues; which present the same characteristics
throughout the entire organismus, although they enter into
relations with organs widely distinct in function and locality.
It would be, however, vain to hope that the diseases of
every tissue could receive sufficient consideration within the
Selection of limits of a single course; and I have therefore selected, for
Serous and
Mucous   our present investigation, the morbid alterations of the
Tissues.   serous and mucous membranes. I have been induced to
select these tissues, by the great frequency of disease in
them, by their very general distribution throughout the
economy, and by the comparative facility of perceiving and
comprehending the changes which they have undergone.
In pursuing the subject, I do not know that any better ar-
rangement of topics can be made than that which I have
adopted, in classifying the pathological preparations con-
tained in our Museum. The deviations from the normal
state, which organs may exhibit, are there arranged in the
following way.

DEVIATIONS FROM THE NORMAL STATE; CONSISTING,

Abnormal   1. In deficiency.
States.
                  a The result of suspended developement.
                  b Loss sustained.
             2. In excess.
             3. In form.
             4. In appearances which may be regarded as the result
of ordinary inflammation.
             5. In appearances which are the result of scrofula.
             6. In appearances which are the result of diseases called
malignant, or resembling them in structure.
             7. In hydatids in the particular organ.
             8. In the effects of accidental injury.

Deficiency.   The first subdivision depends on the deviation from the
normal state, consisting in want or deficiency; and, as this

deficiency may arise in two ways, it has been necessary further to subdivide; and to make a distinction between those cases in which the deficiency is an original state, and those in which, the part having existed in its natural state, a loss has been sustained. As an illustration of the first, I may mention those cases in which the alimentary canal is preternaturally short; either the upper extremity terminating short of the mouth, or, which is a far more frequent occurrence, the lower extremity terminating short of the anus, which is then imperforate. Such deficiency, as I shall hereafter have occasion to shew you, is the result of a suspension of developement taking place at a very early period of fœtal existence. The same may be said of those cases in which a hand is attached, without the intervention of an arm, or, at least, with the intervention of a very short one, to the shoulder—a state, which seems to be the persistance of that which is perfectly natural to the fœtus of a few weeks old. To give you examples of deficiency of the second kind, or that which is acquired, I may instance the cases in which the alimentary canal is shortened by the contraction which succeeds to extensive chronic peritonitis; and those, in which a portion of the rectum has been removed in some cases of disease; or where the existence of an artificial anus has led to the contraction and wasting of the intestine below. The entire arm may be lost by accidental injury; or, remaining, *eye* it may be greatly reduced in volume, as the consequence of mischief in the opposite thalamus nervi optici.

The second division comprises deviations consisting in Excess. excess. This may happen in various ways. There may be merely a preternatural and disproportionate size of a part, constituting what is known by the name of Hypertrophy; as, for example, when one kidney, having to perform the functions of both, acquires nearly double the ordinary size; or, when the heart becomes thickened and dilated in consequence of causes which increase the labour which it has to perform in maintaining the circulation. In such cases, the

increase of size is accompanied by an increase of power in
the organ affected ; but this is by no means invariably the
case in every instance in which the volume of an organ is
augmented. The liver is sometimes enlarged to nearly
double its ordinary size ; but its intimate structure is, at the
same time, so materially changed, that the secretion of bile
is either wholly suspended, or greatly perverted. In other
instances, the excess consists, either in the increased number
of organs, or parts of organs. Thus, instead of one spleen,
four, or even five, have been met with. Numerous instances
have occurred, both in the human subject and in inferior
animals, in which the entire upper or lower half of the body,
with the corresponding limbs, has been double. The liver
has been found possessed of more than the accustomed
number of lobes; and the intestinal canal is not unfrequently
found to have a blind appendix or diverticulum, not alto-
gether unlike that which is found double in birds. Instances
are by no means rare of the hands having six, instead of five
fingers. Such examples of excess, although irregular, take
place in conformity with a law pointed out by Bichat; ac-
cording to which, the compound parts of limbs increase in
number as they become distant from the trunk or centre.
Thus, the upper-arm has one bone, the humerus ; the fore-
arm two bones, the radius and ulna ; the carpal rows have
each four ; and the metacarpal five, which in the abnormal
cases, above mentioned, is increased to six. Similar cases
occur in the lower animals; and we find animals naturally
having cleft hoofs, like the ox, having several smaller hoofs,
and numerous phalangeal bones. Sometimes an excess in
the number or parts of organs depends on the persistance
of parts, which, in the ordinary course of growth, are sup-
pressed in their developement and waste. Of this descrip-
tion are supernumerary ribs; and the presence of the os
coccygis, prolonged into a tail.

Deviation in   The third division consists in a perversion of form not
respect of
form.   necessarily accompanied by alteration of structure or pro-

portionate size. This character is too obvious to require
that much should be said to explain it; and I shall merely
cite a few examples, by way of illustration. One of the
most remarkable, and, at the same time, most important
perversions of form, is found in the pelvis. The brim and
outlet, as they are called, may become so contracted, that
parturition cannot take place without the death of the mo-
ther, or of the child, or of both. Sometimes the legs become
so distorted, that they seem almost to realize the fabulous
description of Erichthonius, who is said to have had serpents
for legs. In some heads, the vertex is preternaturally high
and pointed. Such may be supposed to have been the case
with Pericles, if we may trust the satirical remark of one of
his contemporaries: " Like Jove, an onion on his head he
wears." A whole tribe dispersed over an extensive tract
in the northern regions of North America are charac-
terized by the great depression of the same part, and are
known by the name of flat-head Indians. Internal, as well
as external parts, are liable to deviate from the normal state,
in respect of form: this is particularly the case with the
liver, which readily receives impressions from neighbouring
parts.

The fourth division, which is devoted to the effects of Results of
inflammation, is the most comprehensive and important of Inflamma-
the whole. According to the advocates of the new medical tion.
doctrine which has had such numerous and able adherents
in France, there is scarcely a morbid condition of which
inflammation is not the essence : in fact, they have almost
rendered inflammation and disease synonymous. The na-
tural effect of this, as might very reasonably have been an-
ticipated, has been, to produce its opposite : and Professor
Andral, one of the most accomplished pathologists of the
day, now proposes to reject the word ' inflammation' altoge-
ther; remarking, that it is like a piece of money which
has lost its stamp by wear, and become unfit for further
currency. The old coin, however, notwithstanding its

indistinctness, may long continue far more convenient than
the new, especially if the latter bear a different name and

value. I shall therefore adhere to the use of the old word
' inflammation,' rather than adopt the new term ' hy-
peræmia'; a term which, though sufficiently expressive of
the presence of an undue quantity of blood, which often
marks the state known by the name of ' inflammation,' is
necessarily applicable to many cases distinct from inflamma-
tion, and at the same time is inapplicable to some states
which belong to the various stages and modes of inflamma-
tion. In saying this, I perfectly agree with many of the re-
marks of the author to whom I refer : though I differ from
him, in wishing to retain a term expressive of a process ex-
hibiting phænomena of very varied character, but which
I think it important to keep together as a whole. The
precise nature of the condition, understood by the word
' inflammation,' is so obscure, that there have been many
disputes respecting it, the consideration of which would
occupy hours. I must therefore now dismiss it; after re-
marking, that I hope that the review of its effects, as they
will come before us in our succeeding meetings, will render
in some degree intelligible its various and sometimes oppo-
site consequences.

Scrofula.   In the fifth section are placed those morbid appearances
which are regarded as the result of scrofula or of the stru-
mous constitution. I am aware that such a section must
necessarily contain many objects which might claim classi-
fication in the preceding section ; for it must be admitted,
that the derangements dependent on scrofula or struma are
closely allied to the effects of inflammation ; and might even,
with strict accuracy, be regarded as such, in the most exten-
sive acceptation of the term ' inflammation.' They possess,
notwithstanding, many characters which distinguish them
from the ordinary effects of inflammation ; whilst they con-
nect them among themselves, and distinguish them as a
group of great interest and practical importance. Hence

I deem it unnecessary to make further apology for adopting this arrangement.

The sixth section comprises those morbid appearances which depend on that formidable class of diseases known by the name of 'malignant,' 'cancer,' 'fungoid disease,' and 'melanosis.' These have, by some pathologists, been considered as merely modes of inflammation; but I am induced to give to them a distinct and separate division; first, because their presence is not necessarily accompanied by those symptoms which we refer to inflammation; and, secondly, because they present the remarkable character of depending on an adventitious structure, which derives its growth and nourishment from vascular connexion with the parts in which it is situated, and is consequently very different from the mere degeneration of natural structures. As these diseases may attack all the structures of the body, and moreover present some remarkable features in common, I shall hereafter devote a few Lectures to their especial consideration. *Malignant Diseases.*

The seventh section contains appearances depending on the presence of adventitious bodies, called 'hydatids'; respecting the precise nature of which there exists a diversity of opinion, but I believe the majority are correct in regarding them as parasitical animals. They have no vascular connexion with the parts in which they are found, and are rarely, if ever, even mechanically attached to them. They have, also, the wonderful power of reproducing their kind, often to a very great extent. The appearances to which they give rise are necessarily complex; in part depending on the hydatid itself, and in part on the changes which its presence has produced in its vicinity. *Hydatids.*

The eighth section is devoted to those appearances which result from external violence or injury, whether wound, fracture, concussion, or displacement. They are, of course, more particularly interesting in a surgical point of view; and are so fully described by surgical writers, that I need say very little respecting them. Some of these derange- *External injury.*

ments, however, are highly interesting to the general pathologist, and must therefore not be wholly passed over in a course of morbid anatomy.

Written sources of information. Before I conclude, I must not omit to enumerate those authors, by an acquaintance with whom your pathological studies will be most materially assisted. Let me then recommend to your attention the works of Morgagni, Baillie, Portal, Laennec, Cruveilhier, Rostan, Abererombie, Andral, Bright, Lobstein, Louis, Billard, Carswell, and Foville. I shall from time to time point out more precisely the sources whence you may best derive information on particular points.

You may perhaps be surprised that I should have recommended so large a majority of foreign writers; and be inclined to accuse me of a want of attachment to my country. Such a charge I would resist with indignation. Though I be able to perform little or nothing, in respect of patriotic

Liberal feelings to be cherished. feeling I will allow myself second to none. At the same time, I cannot omit the opportunity of cautioning you against the illiberality of those remarks, which tend to inculcate on your minds, that every thing which is valuable in science has been done in this country, and that foreigners have become eminent only by plagiarism.

The investigators of truth must, if at all successful in their labours, frequently arrive at similar conclusions, although their researches may have had no connection with each other. Nor ought we to regard with dissatisfaction the labours of our foreign brethren, as if nothing remained for us to do. Let us remember the words of Seneca : *Multum adhuc restat operis, multumque restabit, neque ulli nato, post mille secula, præcludetur occasio aliquid adjiciendi.*

To me it appears to be a duty which we owe to our country, to import every improvement, and every new discovery, which the labours, or the superior opportunities of our neighbours, may have enabled them to make. These,

if rightly used, will become so many important implements in our hands, facilitating, rather than retarding, the additions which it should be our ambition to effect.

Nor is it from any want of respect and admiration for our great men of former periods, that I assert modern works of science to be generally preferable to the ancient.   It is the peculiar privilege of our race to profit by the accumulated wisdom of ages.   And, as a falling body comes to the ground with a force compounded of all the forces which have acted upon it in every part of its descent; so one generation, if it perform its duty to that which succeeds it, will transmit, with increase, the knowledge which it derived from that which went before it.   The posthumous influence of great names has too often been productive of evil, by exciting idolatry, rather than imitation.

Modern books more valuable than the ancient.

The temple of Science is erected on a neutral territory, to which no age, and no nation, can lay a peculiar claim. Whilst we see, in its immoveable foundations, those massive stones of memorial which have been laid by the gigantic hands of our great predecessors, Bacon, Harvey, and Newton, we should feel that we are above national jealousy, and be actuated only by a generous emulation; that, while the fabric is happily advancing by the united labours of many nations, our proportion of the work may be such, as to prove that we are not degenerate.   And I would fain indulge the hope, that the ill-bodings of those, who think that they see the symptoms of decrepitude in our country, may prove unfounded—that, for ages to come, she may produce sons who will contribute largely to carry on the work—and that, in every period, the offerings of our countrymen may be amongst the richest accessions to the treasures in the temple of Science.

Conclusion.

LECTURE II.

ON THE SEROUS MEMBRANES.

GENTLEMEN,

My last Lecture has already acquainted you with my intention of making the morbid anatomy of the serous and mucous membranes the subject matter of the present course. It shall be my endeavour to adopt such an arrangement, that the knowledge of the morbid appearances first described may, in some measure, afford a key to the comprehension Reasons for of those which follow. With this object in view, I have selecting made choice of the serous membranes for the commence- the serous membranes. ment of our inquiry. It may however be asked, why I have not preferred the cellular membrane; which is regarded as

the basis of all organs, and which has commonly been selected as affording, in its derangements, the type of those which occur in other tissues. I answer, that I have been induced to make choice of the serous membranes,

First, Because they present themselves to our notice in Nature's earliest processes for the formation of an animal. For whilst the embryo is either scarcely seen, or wholly invisible in the ovulum, its membranes, which bear the strongest resemblance to, if they are not absolutely identical with, the serous, are already distinctly formed. Hence they have been called the forming or generating membranes. They will have a still stronger claim to this appellation, if we admit, with some physiologists, that the alimentary canal and the urinary bladder owe their origin to membranes of this kind; which, though they are only in a few animals sufficiently persistant to be made the subject of accurate examination, are nevertheless supposed to exist at an early period in all.

I may assign, as a second reason for my choice, that Nature seems to delight in the production of reflected membranes—a form which many of the serous membranes present. We not only have them in the more familiar examples, the *arachnoid*, the pleura, the pericardium, the peritoneum, and the tunica vaginalis, but they are also seen in the eye, in the pulps by which the teeth are formed, in the synovial capsules, which are slight modifications of the serous membranes, and, as I shall hereafter more fully explain to you, in very many adventitious formations.

The third and most important reason is, that the large extent of surface presented by some of these membranes affords the best opportunity for observing the varieties in the modes of inflammation, in the products to which they give rise, and in the stages through which they pass.

You are, I presume, so far acquainted with the general characters of the serous membranes, as to render it needless for me to premise much respecting them, in their healthy

1. Early development.

2. Frequency of formation.

3. Facility of observing their derangements.

General anatomy of serous membranes.

or physiological state.   With the single exception of the peritoneum, which communicates with the uterus by means of the Fallopian tubes, they form perfectly closed and independent sacs.   They present two surfaces; the one external, connected, either firmly and intimately, or loosely and feebly, with the neighbouring parts;—the other internal, smooth, polished, and perfectly continuous; in its natural state unattached, but having its different parts everywhere in contact with some other part of the same surface, except when separated by its own proper secretion, contained within the sac.   These closed membranes have been divided into two orders.   The first consists of those which form simple sacs, as we see in the *bursæ mucosæ*.   The second order is complicated; presenting one portion inverted, and received into the other, so as to represent two bags; the one placed within the other, but united at their mouths.   These are called reflected membranes.

Ultimate structure fibrous, not globular.

The ultimate structure of these membranes, like that of the cellular tissue, has been regarded by most minute observers, both British and foreign, as consisting of extremely minute fibrillæ, so combined as to form lamellæ.   By many modern physiologists, French and German, as well as English, these fibrillæ are believed to be composed, in their ultimate analysis, of globules, arranged like strings of beads. This opinion, I am fully convinced, has its sole foundation in an optical illusion.   My friend Joseph Lister, who has carried the powers of the microscope far beyond any thing to which they had previously attained, has very minutely examined this, as well as most of the other animal tissues. He and myself have spent hours in the most careful examination of the subject, and not the smallest doubt is left on our minds as to the absolute fallacy of the globular theory. In fact, this theory appears to be completely set aside by *à-priori* reasoning.   The extremely delicate textures of which animals of the most minute microscopic size are formed precludes the possibility of the ultimate structure being

visible to our eyes, however aided by microscopes. There are animalcules of such minute size, that their entire bulk is not equal in volume to that ascribed by the advocates of the globular theory to one of their integrant or primitive molecules. Lucretius has well observed, concerning the ultimate particles of matter, *Nequeunt oculis rerum primordia cerni.* The perfectly-formed membranes appear, I believe without exception, to consist of fibrillæ of tolerably even size, and in no respect resembling a chaplet of beads. Meckel denies the existence of the fibrous structure in the serous and cellular membranes; but believes that they consist of a coherent, homogeneous substance, which is viscid, amorphous, and, in the cellular membrane, scarcely solid; but more condensed, and coagulated in broad layers, in the serous. I imagine that Meckel must have been led to form this opinion from his having principally examined recent and imperfectly-formed membranes, to which the descriptive character given by him pretty accurately applies.

The vessels of the serous membranes are, for the most part, extremely minute in the healthy state. Rudolphi denies that any vessels exist; but considers that they form a sort of epidermis to the sub-serous cellular membrane which they cover; and Ribes is of a similar opinion. As the serous membranes appear, when fully formed, to be essentially composed of fibres woven into lamellæ, we can easily conceive, though the vessels ramify plentifully through and between these lamellæ, that there must be towards the unattached surface a more dense and continuous aggregation of vessels, which, however, must not be regarded as an epidermis. The active secretion and absorption which are known to be carried on within the cavities of the serous membranes has generally induced the gratuitous admission, to which Mascagni has assented, that they are plentifully supplied with exhalants and absorbents. This admission has however, of late, been refused by Magendie and Fodera, who contend for the old doctrine, that the two functions, to which I have

Vascularity of serous membranes.

alluded, are merely the result of transudation and imbibition.

Whether we unite with them, or prefer the idea of there being two sets of extremely minute vessels, the one devoted to exhalation, and the other to absorption, is perhaps a point of little importance; but there can be no doubt of the facts, that the blood-vessels of a serous membrane often become preternaturally visible and distended, when inflammation is causing an increased effusion; and that, on the other hand, the lymphatics may frequently be seen distended beneath a serous membrane, when a too abundant secretion has been poured into its cavity. Thus we may often observe the lymphatics of the gall-bladder beautifully filled in cases of Ascites.

Innervation of serous membranes. By some it has been denied that the serous membranes are supplied with nerves. In the healthy state, they are certainly endowed with little sensibility; but, when inflamed, they generally become very sensitive, and are not unfrequently the seat of exquisite pain. Yet it ought to be noticed and remembered, that active and fatal inflammation sometimes goes on in these membranes with little or no accompanying pain. I have myself repeatedly observed this fact, in the pleura, the peritoneum, the arachnoid, and the pericardium.

Extensibility, and contractility. There can be no doubt that these membranes are possessed of a considerable degree of extensibility and contractility. We see these properties clearly exhibited in pregnancy and parturition; in the daily functions of the urinary bladder, and of the alimentary canal; and in the effects of hydropic effusions, and of the operation of tapping to remove them. The contractility exercised by the serous membranes is very different from that of muscular fibre, and more nearly resembles elasticity; yet it is certainly connected with the life of the tissue. Beclard calls it *Tonicity*, the name by which the contractile power of the arteries has also been designated. The microscopic observations made by my friend Joseph Lister and myself have

fully convinced us, that there is far greater similarity be-
tween the fibres to be seen in the arterial and serous tis-
sues, than between either of them and the muscular fibre.

Most of these membranes afford a secretion, which, as
their name indicates, bears a very strong resemblance to
the serum of the blood. I would wish, however, to call
your attention to a point, which, so far as I am aware, has
been little, if at all, noticed. I allude to the fact of the gra-
dual transition which we may observe from the most per-
fect serous, to the mucous membranes, and to the converti-
bility of the former into the latter. The fluid secreted by
the arachnoid is the most aqueous of the serous secretions.
The waters in the membranes of the ovum probably rank
next in this respect. The secretions from the peritoneum,
pleura, and pericardium, when they can be collected in any
sufficient quantity, appear, independently of any morbid
alteration, to be more charged with animal matter. By
pressure and friction, we find developed, in the cellular
membrane of particular parts, close cavities, which produce
and contain a mucous secretion, and conduct us to the syn-
ovial bursæ and capsules, in which mucus obviously exists.
Hence the transition is easy to the mucous membrane of
the eye, the secretion of which is more allied to serous
secretion than that of most other portions of this tissue.
Again, if we refer to those examples of the accidental
production of a natural or analogous tissue, which are so
frequent in serous membranes, we find that in some of
these cysts there is contained a perfectly clear, limpid,
aqueous fluid; in others, a straw-coloured serum; in others,
a fluid bearing the closest resemblance to synovia; and in
a fourth class, mucus not less clear and perfect than any
produced by the Schneiderian membrane, or the follicles of
Naboth. Nor is this gradual transition the only approxima-
tion to be observed between serous and mucous membranes:
it may be shewn, that, under certain circumstances, the
former undergo changes, the result of which is to identify

Transition from serous to mucous membranes.

Convertibility of serous into mucous membranes.

them with the latter. If the plausible doctrine to which I
have already alluded respecting the formation of the alimen-
tary canal and urinary bladder were absolutely demon-
strated, it would afford the best proof we could desire :
and, although we want evidence to shew that the serous
bags in question are first formed, and that the cavities
destined to persist in the perfect animal are formed from
them, it is certain that these sacs, at a very early period,
constitute cavities continuous with the organs with which
they are connected. It must be confessed, however, that
in the physiological condition of the tissues we do not find
such clear evidence of the convertibility of the one into the
other, as we have been able to offer respecting the grada-
tions which exist between them. We shall find ourselves
compensated for this deficiency by a reference to their pa-
thological state. I have repeatedly met with the secretion
of the pericardium glairy and ropy, from the quantity of
mucus which it contained. I have found the surface of
the pleura lubricated by a viscid mucus, which made the
lungs feel as if smeared with saliva, or like a fish recently
taken from the water; and, in several cases of inflammation
of the peritoneum, I have found this membrane covered
with a ropy muco-purulent effusion. In ovarian dropsies,
which depend on the developement of large adventitious
cysts of the kind of which I have spoken, the fluid eva-
cuated by the first operation of tapping is frequently thin
and serous; that which is subsequently drawn off is thick
and loaded with mucus; and a fourth or fifth puncture
evacuates puriform matter.

Morbid ap-
pearances
common to
serous
membranes.

These brief comments on the general character of serous
membranes, and the knowledge you have already derived
from other sources, will enable you now to enter on the
pathological phænomena which form our chief object of
inquiry. There are certain morbid appearances which are
common to the whole class of serous membranes; and to
these I shall first direct your attention.

The serous membranes sometimes cease to secrete, and they then become dry. Dr. Baillie has noticed this state in the pleura, and has mentioned its occurrence in the pericardium. Bichat describes the same phænomenon, and its existence has been further confirmed by the observation of my friend Dr. Knox; but I cannot say that I have ever witnessed it myself, except to a partial extent, and under circumstances which admitted of the supposition of the ap- pearance being cadaveric. The synovial capsules are also stated to have been the subjects of diminished secretion.

Gaseous fluids are sometimes found in the cavities of the serous membranes. They are said to have been found be- tween the layers of the arachnoid. It is not very uncommon to find them in the pleura and peritoneum; and they have been met with, though more rarely, in the pericardium. I am quite ready to agree with Dr. Baillie, in supposing that, through some alteration in their functions, the mem- branes may secrete air; but we must be careful not to regard every instance in which a gaseous fluid is met with in the cavity of a serous membrane, as an instance of this phænomenon. There can be no doubt that these collections are often the result of a cadaveric change, even though the inspection be made a very short time after death. We may be assisted in discovering whether this is the case, by ob- serving what is the state of the body in other parts, besides the particular serous cavity in which the presence of gas may have been noticed. The disposition to the cadaveric production of gas often depends, in my opinion, on some peculiar modification which the structures of the body have received before death. In these cases, the emphysema is more or less general, and is usually accompanied by a pe- culiarity of smell. When the corpse has been kept too long, and the production of gas has been noticed, in con- junction with other phænomena dependent on decomposition, a doubt can scarcely exist respecting the cadaveric, rather than the morbid character of the air found in a serous

cavity. Gas, however, may sometimes be met with in some
of the serous cavities, but more especially in the pleura and
the peritoneum; and be neither the effect of the secretion of
air from the membranes themselves, nor a purely cadaveric
phænomenon: it may proceed from the decomposition of
the accumulated product of the diseased secretion of the
membrane, as we sometimes see in empyema, and in cases
of tympanitis; or it may depend on a more mechanical
cause, as when the softening of a tubercle has opened
a communication between the air-tube and the cavity
of the pleura. This, and the decomposition of the secre-
tion, are, I believe, by far the most frequent causes of
pneumothorax. An opening between the intestinal tube
and the peritoneum occasionally becomes, in a similar man-
ner, a cause of tympanitis.

Excess of
secretion.

In the cavities of the serous membranes there are fre-
quently formed, more or less copious collections of their
secretions, without any material alteration of the sensible
properties of the fluids. They constitute the dropsies of
these cavities; and are known by the distinctive names
of Hydrocephalus, Hydrothorax, Hydrops pericardii,
Ascites, Hydrocele, Hydrarthrus, and Ganglion. In many
cases, the origin of these accumulations, the symptoms
which attend them, and also the means which are most
effectual in their removal, tend indubitably to prove their
inflammatory nature. In other instances, they appear to
depend on a passive and atonic state. By whichever con-
dition they may be induced, but more particularly when
they belong to the latter form, the collected fluid is often
very copious: in the peritoneum, especially, it not unfre-
quently amounts to many gallons.

Alterations
in the qua-
lity of the
secretion.

Besides deviations from the regular and healthy quantity,
the secretions of the serous membranes are liable to per-
version in quality. I have already had occasion to notice
their acquiring the characters of mucus. They are found
more or less deeply tinged with bile in jaundice. Occasio-

nally they become sanguinolent; but the admixture of blood
is as often a cadaveric, as a morbid phænomenon. To make
an accurate distinction between these two forms, we must,
as in the case of the presence of gases, be guided by the
nature of the accessory circumstances. If the patient have
died suddenly, and the blood have universally retained its
fluidity—if the various tissues are soft and flabby, and have
become stained by the transudation of the bile or the blood—
there can be little doubt of the sanguinolent colour of the
serum in the different cavities being a cadaveric appearance,
except when the patient is known to have been labouring
under scorbutus, in which case both causes have probably
concurred. When we find the sanguinolent secretion con-
fined to a particular cavity—when the membrane containing
it appears to be rather injected than stained—and, more de-
cidedly, when a local determination or injury is known to
have taken place at the part—we may infer that the appear-
ance of blood is morbid, rather than cadaveric. After all,
I must confess that I have seen many cases in which it was
very difficult, if not impossible, to draw the line.

Dr. Baillie mentions a case in which a considerable quan-
tity of blood was found in the pericardium, where no rupture
of the heart or of any vessel was discoverable. An exhala-
tion of blood is not very unfrequent in the pleura; and
Laennec has attributed to this circumstance some of the
varieties which we shall have to consider, when treating of
the effects of pleuritis. The pleuræ, like the pericardium,
may have blood poured into them from wounds, or the
bursting of aneurisms. I know of no instance of the arach-
noid containing blood, except from apoplexy, or injuries of
the head. The fluid collected in ascites is at times de-
cidedly sanguinolent; and, in one instance at least, I have
seen the particles of blood so effused, of a remarkably bright
vermilion colour. Very copious collections of blood are
sometimes observed in the peritoneum, resulting from lace-
ration of the liver or spleen, from the rupture of large

vessels, or after the operation for strangulated hernia, &c. In the tunica vaginalis testis we have the opportunity of observing, during life, the effusion of blood into the cavity of a serous membrane, constituting the disease termed Hæmatocele.

Supposed presence of chyle and milk.

Chyle and milk are both said to have been found in the cavity of the peritoneum. The former is a very unlikely, though just possible, occurrence: the latter, quite absurd and incredible. In the cases which are related, as instances of this kind, a light-coloured, puriform, inflammatory, effusion has, in all probability, been mistaken for milk. Bichat says, that the secretions of the serous membranes, but more particularly of the peritoneum, sometimes become discoloured, and of a highly offensive odour.

Deficiency of serous membranes.

Deficiency of the whole or a part of any of the more important serous membranes is a comparatively rare occurrence. The arachnoid must of course be wanting, in common with the other parts of the head, in acephalous fœtuses. When, as sometimes happens, that part of the dura mater which forms the falx is deficient, there is also absence of the corresponding portion of arachnoid. I know of no instance of the pleura being wanting, except when a monstrous fœtus has consisted of nothing more than the abdomen and legs. Some years ago, I saw an example of this kind in the Hunterian Museum at Glasgow: there are three in our own Collection, and many others are on record. Several instances of deficient pericardium have been recorded by various authors. Some of these are supposed to have been nothing more than cases in which the opposed surfaces of membrane have been universally adherent; but one example, examined and described by Dr. Baillie, and another detailed by Breschet in the Repertory of Surgery and Pathological Anatomy, stand on too good authority to be called in question, and leave no room to doubt the possibility of this deficiency. Fœtuses have often been produced, in which the anterior part of the peritoneum, and the cor-

responding portion of the parietes, have been wanting, leaving the abdomen open. When the testes, failing to descend into the scrotum, have remained in the lower part of the abdomen, the reflected portion of the tunica vaginalis is of necessity wanting. We have an instance of this kind in the Museum. It was taken from the body of a young man, on whose mind the idea of deficient virility produced so depressing an effect, that he destroyed himself.

We find also instances of deviation from the normal condition of the serous tissue consisting in excess. It may be of two kinds :

First, one of these membranes, naturally belonging to the system, may have a part or parts exuberant. This circumstance occurs in the arachnoid, in conjunction with a congenital protrusion of the brain. In a case of this kind, which I had an opportunity of examining, the membranes were so altered, that it was by no means easy to distinguish them ; but that which there seemed reason to consider as arachnoid, was of very remarkable thickness. In the cavity of the chest we sometimes meet with appendices formed by an extended process of pleura, giving a covering to collections of air or fat. In form, the latter somewhat resemble the comb of a cock ; and in character, they are allied to the appendices epiploicæ of the colon. Similar appendices are occasionally found in the pericardium, and in synovial capsules. It is however in the peritoneum that the deviations from the normal or healthy state, consisting in excess, are the most frequent and remarkable. We see them in all cases of hernia, except in those of the congenital kind : and the sacs which are formed in these cases are sometimes, as you well know, of very large size. Within these sacs, adventitious cysts are likewise occasionally formed. In a specimen of this kind, preserved in our Collection, there were two of these cysts ; one of which was capable of containing considerably more than a pint of fluid. In the tunica vaginalis we find, occasionally,

prolongations of the serous membrane, in the form of small
cysts with slender peduncles. Similar and analogous cysts
are perhaps of more frequent occurrence in females, at-
tached to the ovaries and Fallopian tubes, and consisting of
prolongations of the peritoneum.

2. In the for-
mation of
new cavities.
I have already alluded to the second form of redundancy
of the serous tissue; viz. that which depends on the produc-
tion of entirely new cavities. I shall not now enter into
the consideration of the morbid appearance to which they
give rise, as they are sufficiently curious and remarkable to
claim our special attention on a future occasion.

Effects of
inflamma-
tion.
We have now to consider the effects of inflammation on
the serous membranes. These constitute some of the most
frequent, and, at the same time, some of the most important
phænomena which morbid anatomy brings under our notice.
The term Inflammation is variously defined and understood
by different authors. Laennec used to describe it as an
afflux of fluids to a particular spot, with a tendency to the
production of pus; but I cannot say that I quite approve of
this definition, which is little applicable in practice. Brous-
sais regards all transformation and deposits as the effects of
inflammation, and thus almost makes inflammation synony-
mous with disease. Dr. Baron, on the contrary, excludes
from the list of derangements attributable to an inflamma-
tory process, many conditions which common consent has
connected with it. It may be thought necessary that I
should attempt a definition of what I myself understand by
inflammation. I shall not, however, encroach on the pro-
vince of your able teachers of Medicine and Surgery, in
order to grapple with this knotty question; but shall content
myself, for the present at least, with bringing before you
those appearances which I conceive to be the consequence
of this morbid action.

Serous
membranes
liable to all
forms of in-
flammation.
It is generally taught, that the adhesive inflammation is
that which belongs in an especial manner to the serous
membranes; and that inflammation, when set up, has a ten-

dency to spread over their entire surface.   I trust, however,
to succeed in shewing you, that the serous membranes ex-
hibit nearly all the forms of inflammation which we meet
with in other tissues; and that many of the various appear-
ances which present themselves in the products of their
inflammation depend rather on differences in the morbid
process, than on the periods at which the products of one
and the same process are observed; though it is equally true,
that many varieties are ascribable to this latter cause.

It appears, that the first effect of an irritating cause ap-   Earliest
plied to a serous membrane, in sufficient force to excite its   effects of in-
                                                                flammation.
inflammation, is, to suppress the secretion, by which its smooth
surface is naturally lubricated.   It rarely happens that a
serous membrane, in this stage, is exposed to our view; yet,
as we have already seen, on the authority of Baillie, Bichat,
and some others, the serous membranes have been met with
perfectly dry.   As the irritation subsides, transpiration
returns, and the surface is again lubricated; but if the in-
flammation have been violent, resolution does not take place,
and the serum exhaled does not possess its ordinary qualities.
Though by no means uniform in its characters, the exhala-
tion is, in most cases, superabundant in quantity; and is
mixed with some more solid material, giving rise to various
forms of false membrane, and often rendering the fluid more
or less turbid and opaque.   Villermé, who has written an
elaborate dissertation on the production of false membranes,
describes this altered secretion as more or less resembling
the result of the suppuration of cellular tissue.   False mem-
branes, he states, are always the effect of inflammation; and
he regards them as the matter of suppuration thickened and
concreted.   The turbidity of the serous effusion he ascribes
to the admixture of flocculi of concreted albumen; the quan-
tity of which, he adds, is in proportion to the violence,
duration, and extent of the inflammation.   When these ap-
pearances are not observed in persons who have died of
suspected pleurisy, inflammation of the muscles or cellular

membrane must, in most instances, have been mistaken for
it. Yet, according to the author to whom I have already
alluded, an individual may die, after having exhibited all
the marks of pleuritic inflammation, and little, if any trace
of it, may be found on inspection. He accounts for this
anomaly, by supposing that the red blood leaves the capil-
laries, unless they had admitted it for some time before death.
Such cases are, I have no doubt, extremely rare. From
Post-mor- my own experience, I can cite none in which the inflamma-
tem evi- tion, however recent, had not left some traces of its existence.
dence of in-
flammation. If the inflammation have been very rapid and intense, and
the patient have died on the second or third day, it is very
possible that no false membrane may have been formed ; but
we find an effusion of serum, which, in the majority of cases,
is sanguinolent or puriform. In a few instances, I have
noticed an effusion, nearly or quite clear and transparent,
but possessing the power of coagulating, on its removal from
the body, after the manner of blood, but in a much feebler
degree. The serous membrane affording this effusion is
more manifestly vascular than in its physiological state ; and
this increased vascularity, instead of being uniformly diffu-
sed, more frequently produces the appearance of numerous
very minute, closely-placed, and irregular red points ; and is
generally accompanied by small ecchymosed spots on the cel-
lular membrane situated behind the serous. Villermé obser-
ved this condition of the pleura in two persons who had been
suddenly exposed to cold water whilst they were hot and
perspiring. The same thing has been noticed by Dupuy-
tren ; and I have myself seen it where death had speedily
followed a severe accident, one of the effects of which had
been fracture of the ribs.

The various appearances exhibited by the products of
inflammation on the serous surfaces, and more especially the
Formation formation of false membranes, form the most interesting
of false part of our present inquiry. The most minute and detailed
membranes. account of these formations, with which I am acquainted, has

been given by Villermé; who has undertaken to unfold the
opinions of Dupuytren, in whose researches he appears to
have assisted.   As these views are, I believe, pretty gene-
rally received, in consequence of the authority from which
they emanate, and as they bear some little resemblance to
the doctrines of Sir E. Home concerning the organization
of pus, I shall lay them briefly before you.   At the same
time, I must state, that while I see no reason to doubt the
fidelity of most of the descriptions of particular appearances
given by Villermé, I differ widely from his views of the
relations which these appearances bear to one another.

The changes which adventitious membranes undergo, Views of
from the commencement of their formation to their com-   Villermé and Dupuy-
plete organization, are divided by Dupuytren into four   tren:
stages: 1st, Formation; 2d, Growth; 3d, Organization;
4th, Transformation into cellular tissue.

As to the first stage or period of formation, the following   1. As to the formation of false mem-
facts and doctrines are propounded.   branes.

If, after having excited inflammation in the pleura of a
dog, the chest be opened in twenty-four or thirty hours, the
pleura is found minutely injected; and at the spots in which
the inflammation is most intense, the membrane is pulpy,
and has an appearance of villi, which are very short, gene-
rally of a dead-white colour, delicate in structure, and easily
removed.   According to Villermé, these villosities, in-
creasing and combining, constitute the false membrane.
The recent membrane, so formed, adheres by one surface
to the serous membrane which secreted it; while the other
unattached surface is mammillated somewhat like a granu-
lating surface, and offers numerous floating villi.   At this
time, the effused serum appears to be only altered in quan-
tity; but it afterwards becomes turbid, from the numerous
flocculi dispersed through it, which appear to be some of
the villi before mentioned, detached by friction.

During the period of growth, the flocculent villi are said,   2. As to the growth of false mem-
by their union, to form layers of more or less extent and   branes.

thickness.   The false membrane thus produced, attaches
itself, with increasing firmness, to the serous membrane; the
surface of which, when the false membrane has been de-
tached, appears tomentose or flocculent : but it not unfre-
quently happens, that shreds and layers of adventitious
membrane become partially separated, and float in the ef-
fused fluid.   This appearance, he remarks, is far more com-
mon in the abdomen than in the thorax; owing, in all
probability, to the more extensive and varied movements
of the contained viscera.   When a portion of false membrane
has been detached from the serous, this latter furnishes a
new exudation, which, from its tenderness, may be easily
recognised as the more recent.   On the subsidence of the
inflammation, a serous or purulent fluid may sometimes be
seen to raise the false membrane, and assist in its separation.
Such detached portions, which are most frequently seen in
the abdomen, are occasionally of large size, white, soft, and
tremulous.   Sometimes the adventitious membrane becomes
pulpy, friable, and *cheesy ;* and the effused fluid increasingly
turbid and milky, or purulent.   Every possible interme-
diate variety is to be met with between the minute flocculi
which produce the milky appearance of the effusion, the
large flakes resembling fragments of cheese, and the most
completely-formed false membranes.

This Villermé considers a convincing proof that the
whole difference in the product of inflammation consists in
the greater or less consistence of the flocculi—in their proxi-
mity—their number—and the quantity of serum in which
they are suspended, or by which they are bathed.   He is
hence induced to believe, that whatever is rapidly produced
as an effect of inflammation, is pus; which will present diffe-
rences in its characters dependent on the structure and pro-
perties of the parts affected, and on differences in the irri-
tation of which they are the seat.

Thickness   It is at the close of the second period that false membranes
of false
membranes.   are of the greatest thickness.   Sometimes they do not equal

the thickness of a shilling; at other times they exceed that
of a crown-piece. Villermé mentions a false membrane
which united the opposite surfaces of the pleura, and ex-
ceeded half the thickness of a finger. Stoll says, that a false
membrane investing the lung, and universally adherent to
the pleura costalis, has sometimes been met with upwards
of an inch in thickness: and Broussais mentions a false
membrane between the convolutions of the intestines which
was two or three inches in thickness. False membranes are
generally thickest at the most declining part; favouring the
idea, that the detached portions had been precipitated, and
that by their superposition they had increased the thickness
of the lower portions. Haller has noticed the case of an
old woman in whom a clotted collection of cheesy matter
was found between the uterus and rectum, without any
thing similar existing in any other part of the peritoneal
cavity. An appearance of this kind has been repeatedly
seen by myself, in the same situation.

As clots form, the serum loses its milkiness, and slowly   Absorption
approaches to transparency. It has been thought that false   of false
membranes.
membranes, in their second period, may be entirely ab-
sorbed; but Villermé thinks it probable that it is the albu-
minous clots and flocculi which are mixed with the serum,
rather than the false membranes which are so removed.
There are now no longer any villosities. The false mem-
brane, homogeneous in its texture, of a white or yellowish
colour, and possessed of a certain degree of consistence,
becomes daily more firmly adherent to the serous mem-
brane.

The third period now commences; in which it is rare to   3. As to the
meet with those flakes and ragged projections on the un-   organization
of false
attached surface of the false membrane, which are common   membranes.
in the second stage, but which are never found in the fourth.
This period commences as soon as the false membranes
are possessed of vessels. They acquire a greater degree of
consistence, and not unfrequently an appearance similar to

what is called ' lardaceous substance'; while at other times
they resemble, in colour and consistence, the inflammatory
coat on blood.   This latter state Villermé notices to pre-
cede usually that which presents the lardaceous appearance.
The false membrane at this period frequently seems to be
made up of several intimately-adherent layers.   In the
chest, it often invests the whole lung, and is almost always
universally or partially adherent to the pleura costalis.   The
substance of the false membrane is frequently homogeneous,
firm, and coriaceous.   It possesses a tenacity and firmness
approaching to that of pure fibrin, and has occasionally
been met with almost or quite cartilaginous.   If at this
stage the false membrane be removed from the serous, to
which it pretty strongly adheres, this latter will be seen ap-
parently healthy.   It does not seem to be at all injured ; and
we merely perceive some small drops of blood proceeding
from the rupture of the vessels of communication.   At
a later period, when the false membrane has diminished in
thickness, the adhesion becomes more intimate ; and the se-
paration cannot be made without injuring the serous mem-
brane, and destroying the polish it naturally possesses.   In
cases in which the pleura is extensively concerned, it is not
uncommon at this period for two layers to be distinguish-
able by the eye, the one adherent to the pleura pulmonalis,
the other to the pleura costalis.   They are however, at
numerous points, united between themselves, though with
less firmness than to the pleura ; the medium of connection
being an exceedingly fine cellular tissue, which we find infil-
trated, and which has been compared to the hyaloid mem-
brane of the eye.

Time at
which ves-
sels become
perceptible
in false
membranes.

The time at which vessels begin to be visible in false
membranes appears to be very different in different cases.
Villermé has never seen them before the twenty-first day,
from the invasion of the malady ; but Stoll mentions cases
in which organization appeared to have taken place as early
as the twelfth, or even the eighth day.   I believe a still

shorter time has been noticed by some; and I think my own
observation confirms the fact.

Villermé thinks, that, in general, vessels are first visible
in those parts of the false membrane which correspond with
that part of the serous in which the degree of inflammation
is the greatest.   He says, that red vessels first become visi- Form of
ble in the false membranes, in the form of thinly-placed, their first
nearly straight, lines. They lengthen, multiply, and ramify, appearance.
by the formation of other lines proceeding from them at
angles which are more or less acute. They take an oblique
course; and generally commence where the false mem-
brane is the thickest, and where the serous membrane be-
neath is the most injected.   Sometimes, if a section be made,
shewing the two layers interposed between, and uniting
the two opposed surfaces of the serous membrane, different
sets of vessels may be seen passing through these layers,
and producing the appearance of two red bands, between
which is the whiter and less-injected substance which unites
them.

Although the effused coagulable matter receives the The false
vessels which are prolonged into it, Dupuytren believes, and thus orga-
Villermé agrees with him in the opinion, that it is not of nized, is not
this substance that the cellular tissue, the ultimate form persistent.
which he thinks that the false membranes always may
assume, is composed. These observers consider, that the
result of the organization of the originally effused matter,
which they regard as a concrete pus, is the absorption of
this matter; and its replacement by cellular membrane, con-
sisting of a new material formed by the action of the new
vessels.   In arriving at the state of completely-formed cel-
lular membrane, which constitutes the fourth stage, the
false membranes become thinner and tougher, and, as Vil-
lermé says, lose the lardaceous appearance which they pre-
sent during a part of the third stage.

In the fourth stage, in which the conversion into cellular 4. As to the
membrane is complete, it is frequently difficult to distinguish formation
of cellular

membrane, the persistent result of inflammation.

the new membrane from the original serous; to which it often so closely adheres, as to appear identified with it. Its smooth and unattached surface secretes a lubricating serum, similar to and replacing that formerly secreted by the membrane which it invests. It is liable to the same morbid action as the serous membrane; and often, by its inflammation, produces effusion and new false membranes, more especially if a part of the original effusion remain unorganized, and, continuing to act as a foreign body, from time to time renew irritation.

Such are, I believe, the most generally received notions respecting the formation and progress of false membranes produced by inflammation on the surface of the serous membranes. It seemed incumbent upon me to lay before you these generally received doctrines, before I offered to your notice those modifications which repeated opportunities for observation have induced me to think necessary. Notwithstanding the accuracy of Villermé in describing the appearances which at any particular time presented themselves to his observation, I repeat, that I cannot agree with him and Dupuytren in the view which they have taken of the relation which the different states described, bear to each other. I find it impossible to unite with these authors, and with Sir Everard Home, Laennec, and several others, as to the organizable properties of pus or puriform secretions. I believe them to be always, more or less, excrementitious; and that where an outlet from the body is not afforded, they invariably retard cure, by interfering with the progress of organization in those substances which are formed in conjunction with them, and are susceptible of this change. You will remember, that I have mentioned several varieties in the effusions met with in the cavities of serous membranes; and I would particularly recall your attention to one form which has the power of coagulating like blood. This I believe to be the most eminently plastic effusion, which, as coagulation advances, very

Objections to the views of Villermé and Dupuytren.

Purulent matter inorganizable.

False membranes generated by coagulable effusion.

rapidly assumes the form of tender diaphanous films, which we find separated by, and infiltrated with, a limpid, but often straw-coloured serum. They are not in general originally applied and attached to the surface of the inflamed serous membrane; and it frequently happens that the union is ultimately only partial, yet amply sufficient for their organization and support. Though these diaphanous films, or incipient false membranes, do not appear to be necessarily formed in immediate contact with the surface of the serous membrane, it is no less obvious, that their formation is often, if not generally, materially influenced and modified by the membranes in the cavities of which they are contained, as may be best seen in the peritoneum; since we find them assuming the form, and adapting themselves to the irregularities of those cavities, even where they are accompanied by a large proportion of serum.

The opinion which I wish to support in opposition to Villermé, and which I have been led to form by a careful examination undertaken in consequence of perusing the work of Villermé, is, I believe, in some points, little more than a return to the doctrine of John Hunter, though not borrowed from him. I find myself perfectly in accordance with this great master of his profession, in regarding the formation of the tender diaphanous films composed of the plastic part of the effusion (the coagulable lymph of John Hunter) as the result of a process of the same nature with the coagulation of the blood. Hence, from the first, they are continuous and homogeneous, even whilst they can scarcely be said to be solid; a state which they attain by the separation of the serum, rather than by the aggregation of floating particles or villi. Nothwithstanding their tenuity, and soft and tender texture, they often form bags or pouches capable of retaining the serum. This fact appears to me to militate strongly against the idea entertained by Villermé, and sanctioned by no less an authority than that of Beclard, that the form of membrane or film is

False membranes not opaque and cribriform, but continuous and transparent.

produced by the aggregation of an infinite number of
minute flocculi. Were this the case, we should not only find
most recent membranes, to a certain degree, cribriform, and
incapable of retaining fluid, but, as Villermé seems to admit,
they would be more or less opaque.   To obviate this
objection, he appears to have considered the transparent
membranes as further advanced than he is warranted in
doing.

The production of transparent membranes about the
embryos of viviparous as well as oviparous animals affords
another strong confirmation of the view which I have
taken.   These last membranes form the nidus in which the
developement of vessels may most rapidly take place ; and
the false membranes, of the form of which I am now speak-
ing, seem most strongly to resemble them in this respect.
It is to this form of effusion, then, that I attribute those
loose and most perfectly cellular adhesions which we so
frequently meet with in the examination of bodies. Their
organization is probably completed in the shortest time,
and with very little constitutional derangement : hence it is
not surprising that we are so frequently unable to refer them
to any known attack of inflammation.   It seems likely that
a trifling effusion of this kind, succeeding to the suppression
of the accustomed exhalation from the serous surfaces, may
have occasioned that close adhesion of the two surfaces of a
serous membrane, which has induced some to conclude that
they were united without the intervention of any adven-
titious matter.   If, however, the attack of inflammation
producing this effusion be very severe, a considerable
quantity of this plastic material may be thrown out, and the
attendant symptoms will be proportionately severe and pro-
tracted : yet, if the effusion be purely of this kind, and the
organization of the false membrane be not interrupted, we
may still have those completely cellular and diffused adhe-
sions, which, as in the case of the radical cure of hydrocele,
are so far from being a source of irritation, that they may

be regarded as a safeguard against the recurrence of disease.

There is a form of effusion most completely opposed to that which I have just described. It is more or less opaque and turbid, of a light yellow or soiled-white colour, not so thin as serum, but of a somewhat viscid consistence; more nearly resembling thin pus, and having no tendency to form adhesions between the contiguous serous surfaces. The effusion into the peritoneal cavity, in many cases of puerperal fever, is of the kind of which I am now speaking. Between this last form of effusion, in which the plastic property appears to be wholly wanting, and that which I first described, there are numerous gradations, dependent, as I believe, on the different proportions, in which the minute particles, which give turbidity to the effusion, are mixed with the plastic matter. Sometimes there is only a sufficient quantity of the latter to unite the former into light-coloured opaque flocculi and flakes of various sizes, of feeble cohesion, either very slightly adherent to, or wholly detached from the serous membrane, and absolutely incapable of organization. At other times, the quantity of the plastic material in the effusion is sufficiently great to allow of its assuming the form of membranous layers, or of an opaque, whitish, false lining to the cavity. Its organization, though not always prevented, is very much retarded by the opaque particles; which are either uniformly diffused through it, or found in more or less isolated and detached collections of different sizes; and bearing considerable resemblance to tuberculous matter, to which I apprehend they are very closely allied.

With respect to this whitish opaque matter, which, in the form of minute particles diffused through the serum, renders this fluid turbid, milky, or puriform; and which, when combined with the more plastic material, either renders it uniformly opaque and of feeble cohesion, or sprinkles it with opaque points, or with collections of puriform or

A second kind of effusion, non-plastic.

Forms intermediate to the non-plastic and most plastic.

The opaque matter present in non-plastic effusions endowed with little vitality.

tuberculous matter; I am inclined to believe that it prin-
cipally differs from the material which I first described, in
its very inferior degree, or, perhaps, total want of vitality.
This may either depend on its original formation, or have
been acquired.   The former is probably often the case; but
we see examples, in which the latter is the more probable,
not only in the false membranes of which we are speaking,
but also in certain productions, resembling polypi, occasio-
nally formed in the heart; in pulmonary tubercles, passing
from the miliary and transparent, to the crude state; in
scrofulous absorbent glands, and in various tumors in
which the process of decay has commenced.   It is when
false membranes possess this compound character, and more
particularly when the inorganizable matter abounds, that
they are (as Dupuytren and Villermé have said) a constant
source of irritation.   Hence, we have repeated exacerba-
tions of inflammation, and find the material produced by it,
of various ages, and in different states and stages of pro-
gress.   These, as Dr. Baillie has remarked, are not merely
the effusion from the original serous surface.   The false
membrane becomes itself a secreting organ; sometimes
yielding a particled puriform fluid; and at others, more plas-
tic lymph, which may assume the most perfect membranous
form.   I have noticed this latter state on the surface of
false membranes, whilst they themselves were plentifully
loaded with opaque matter.   The fact, that they may be
opaque, whilst those which they have produced, and which
must necessarily be more recent, are transparent, is, I con-
ceive, an insuperable objection to the views adopted by
Villermé.   At other times, the first-formed layers may be
more organizable: in which case, if not too much irritated
by the presence of the inorganizable material which it has
produced, it eventually takes up so much of it as is suscep-
tible of absorption; and shuts up the remainder, precisely
as a bullet, or any other quietly-lodged foreign body, is en-
closed in a cyst of condensed cellular membrane.   In this

The non-
plastic effu-
sion is the
source of
irritation.

False mem-
branes,
though
opaque,
throw out
new trans-
parent
membranes.

observation, you will perceive that I am again at variance with Villermé, who supposes the opaque albuminous portions to be susceptible of absorption.

When the false membranes have been organized for a short time, they are reddened by the innumerable minute vessels which they contain; but they become, subsequently, much paler. In these two states, they have often been confounded with the serous membranes themselves; which have hence been erroneously described as extraordinarily thickened, carnified, or lardaceous. The existence of vessels in false membranes was first pointed out by Stoll. Dr. Baillie injected them; and Dupuytren appears to have done the same, without the knowledge of what Baillie had done. Villermé says, that in the third stage, in which, though organized, they have not yet assumed the form of cellular membrane, they may be injected with mercury, but not with other materials. I believe, on the contrary, that they will admit of fine size injection, at a very early period.

The production and developement of vessels in the membraniform secretion from the surface of an inflamed serous membrane, is a very remarkable phænomenon. How, says Villermé, is a concretion, the accidental product of disease, and which in fact may be regarded as a foreign body, to become a part of the organ in which it is contained, and to participate in its organization? In what manner, in short, do false membranes become organized? Are they the bed into which the extremities of the vessels of the exhalant surfaces are prolonged? or is there a real generation of vessels? This latter idea is so repugnant to all our present notions respecting the circulation, that it cannot be admitted, notwithstanding that red vessels are first seen in the false membranes, without our being able to trace their communication. The increasingly intimate adhesion of the false membrane to the exhalant surface, and the sort of filaments which are sometimes seen to form the medium of this union, are circumstances which would induce us to admit an

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affirmative to the first query. This, however, seems to be most strongly supported by the fact, that injections may be thrown into them from the neighbouring vessels.

Though I see no room, therefore, to doubt for a moment the source whence the new vessels are derived, we are still very much in the dark as to the mode in which the formation takes place. I cannot think, with Sir E. Home, that they commence as canals formed by the passage of globules of air through the semicoagulated effusion. My own opinion is, that, at the inflamed part, the minute blood-vessels not merely become distended, but that their delicate parietes, and the structure through which they ramify, become softened, and, yielding to the pressure of the blood in the distended vessels, give way at numerous minute points. This I believe to be the explanation of the fact, that when we raise an adherent false membrane of a few days standing, we find that the original serous membrane beneath has lost somewhat of its polish, and presents numerous minute bloody points. The very small quantity of blood thus escaping from its vessels does not diffuse itself, but is received into the soft substance of the false membrane, which accordingly exhibits numerous bloody points on the surface which has been detached from the serous membrane. These spots, which are at first irregular, afterwards have a dendritic appearance; and extending in length, they become vessels. These vessels being feebly supported, are distended and larger than those in the original structure from which they proceed; hence the redness of newly-organized false membranes. At a subsequent period, these vessels contract, and may become nearly or quite invisible. As the mode of production of new vessels belongs more particularly to another division of our subject, I shall dismiss it for the present: but you will observe in this process, as I have just described it, an instance of softening as an effect of inflammation. We shall have other instances of this effect accompanying

recent inflammation, as well as of the opposite state, or induration, being likewise a result of inflammation; and I think you will find that each of these opposite effects admits of a satisfactory explanation.

Vessels are not only extremely numerous in recently-organized false membranes, but often produce a very remarkable appearance, by the uniformity of their size, and by their straight and parallel course, which, when they are recent, gives them some resemblance to muscular fibre. I have met with this appearance most frequently in the cellular adhesions within the thorax; but I have also seen it in the abdomen, more particularly in the lower pelvis. It appears to depend on a certain degree of motion in the part; as, *ex. gr.*, between the surface of the lungs and the parietes of the thorax in respiration, or in the action of the levator ani, whence these lines are met with in the pelvis between the uterus and rectum.

Villermé has stated, that the formation of vessels is first recognisable in those parts in which the false membrane is the thickest. I am not prepared to dispute the accuracy of this remark; but I have no hesitation in saying, that there is the greatest difficulty in completing the organization of the effused material in those spots in which it is most abundant; as, for instance, when collected between contiguous convolutions of the intestines: and this difficulty is the most observable, when the effusion is rendered opaque by the abundance of inorganizable matter.

By a wise provision of nature, the surface of the effusion first becomes consolidated and membranous; and thus frequently a smooth and serous envelope is formed, shutting out, from the rest of the cavity, the internal part; which, if its organization does not proceed, acquires an increasingly puriform appearance. At the same time, ulcerative absorption takes place in that part of the serous membrane with which the mass is in contact: and thus, while the collection of pus continues to increase, a way of escape may be pro-

vided, without an effusion of the puriform fluid into the
general cavity.

Formation
of bridles of
adhesion.

It not unfrequently happens, when the adhesions are
not universal, and the motion between the serous sur-
faces is considerable, that lengthened bridles are formed.
These are serous externally; but, by some, have been de-
scribed as cellular internally; and, by others, as soft and
pulpy. Both observations are doubtless founded on fact,
and tend to illustrate the remark which I have just made.
In the one case, the interior, as well as the surface, have
assumed the membranous character; whilst in the other it
is inorganizable.

Formation
of *blebs*.

Sometimes a delicate false membrane, the product of a
highly plastic inflammation, is raised by the serum between
it and the original serous membrane, so as to produce
bladders or cysts of various sizes and shapes. Sometimes
they assume the form of large grapes; and in this case they
are liable to be confounded with hydatids by poor ob-
servers and worse morbid anatomists. Occasionally, these
sacs are so long, in proportion to their width, and so cylin-
drical, as to have the form of a tube, and to resemble a
portion of intestine of extreme tenuity, terminating in a
cul-de-sac. This production of false membrane in the form
of cyst occurs most frequently in the peritoneum; but it is
also seen in other serous membranes.

Presence of
detached
bodies.

Detached bodies are sometimes found in the cavity of a
serous membrane. They are of various sizes and appear-
ance, and differ in character as to the material of which
they are composed; yet I believe that these varieties de-
pend on the stage of their existence in which they come
under observation, and on the transformations which they
undergo. I believe they commence as an isolated clot of
coagulable lymph; the smooth convex surface of which has
contracted no adhesion, either to the serous surface, or to
any other portion of false membrane. In process of time.
the surface acquires a sufficiently membranous and firm

consistence ; and the detached body, instead of forming a clot of cheesy matter, contracts, losing its serous or watery part. If this take place rapidly, and materially reduce the size of the detached body, the surface exhibits an uneven or corrugated appearance. When of small size, they more often retain their smooth surface, and an increasingly firm structure, which becomes loaded with earthy matter, as I apprehend, by a process of endosmosis. These detached bodies may be seen, in the most recent state, wholly consisting of coagulable lymph, having a cellular character, infiltrated with serum, and presenting the size and figure of an egg-plum, somewhat flattened ; but I have never seen them in the firm and advanced stage, which I have described, larger than a pea or a marble.

There is another form of the product of inflammation of the serous membranes, which I think can scarcely be referred to any of those before described. It is, from the first, more adherent to the serous surface than either the very recent membranous films, or the opaque, inorganizable flocculi. It has a firm and dense structure ; does not become very, or even visibly vascular ; and presents an uneven, unattached surface, towards the interior of the cavity. Sometimes it is scabrous, not unlike the papillæ on the tongue of an ox ; at other times, it has a more reticulated, or honeycomb, appearance. If my observation is correct, it is generally accompanied by a good deal of fluid effusion ; which, though not always clear, seldom, if ever, contains either membranous films or large opaque coagula. *Scabrous surface from inflammation.*

It seems probable that inflammation may be set up at successive periods in different parts of the same serous membrane. Villermé is of this opinion ; and adduces, in proof of it, the case of a man wounded by a bullet, in whom the pleura costalis was covered by a false membrane, already arrived at the commencement of the third stage, whilst a still more recent and pulpy one invested the pleura pulmonalis. *Inflammation successively set up in different parts.*

It has often been remarked, that when inflammation has
attacked any of the serous surfaces, it has a strong ten-
dency to spread and diffuse itself over them. We see this
exemplified in the cure of hydrocele, by the introduction of
a seton. It frequently happens, however, that the inflam-
mation, although its limits are not defined, is far from ex-
tending itself over the whole surface. The characteristic
disposition to spread is certainly most conspicuous where
the inflammation is idiopathic; and the exceptions are most
striking, where the inflammation has been set up by a purely
local and mechanical cause. In these cases, we may fre-
quently meet with the inflammation very much circum-
scribed: hence the mode of treating hydrocele, to which
I have before alluded, is often unsuccessful. It would
seem that the simultaneous injury of the opposed and
corresponding parts of the serous membrane is favour-
able to the limitation of inflammation. Thus, if a patient

have recovered from a penetrating wound of the thorax,
by which both the pleura costalis and a corresponding
spot of the pleura pulmonalis have been injured, you will
very probably find the pleuritic adhesion confined to the
immediate neighbourhood of the wound. Bichat had an
opportunity of examining the body of an individual who
had been affected with melancholy, under the influence of
which he had, at different periods of his life, wounded him-
self with a knife twelve or fifteen times. In the most
recent wounds, the intestines adhered to the parietes; in
those which were somewhat older, they were connected
by bridles; in a third class, which were of longer stand-
ing, the bridles were longer, and more slender; and in
those which were the oldest, and of very long standing, the
connexion was dissolved. You must, all of you, be aware of
the very great danger which attends a wound of the dura
mater; which, producing an opening into the cavity of the
arachnoid, is extremely liable to lead to acute inflamma-
tion of that membrane, seldom affecting less than the

entire surface of one hemisphere, and often extending
over both. Yet, if the injury have been still greater, and
have affected not only the arachnoid lining the dura mater,
but that which covers the brain, and have even produced
the loss of a portion of that organ itself, it is by no means
uncommon for the symptoms to be comparatively slight.
The late Henry Cline, jun. used to lay considerable stress
upon this fact, in conjunction with injuries of the head;
and suggested the propriety of designedly lacerating the
arachnoid and pia mater, in cases in which the dura mater
alone has been wounded.

False membranes, at an early period of their organiza- False mem-
tion, are tinged with yellow, in persons affected with branes dis-
tinguished
jaundice.   The serum which accompanies them is of in jaundice.
the same colour, and tinges linen moistened with it; yet
the serous membrane itself does not participate in this dis-
coloration. This remark is confirmed by many authors.
The strikingly yellow colour of the polished surface
of the dura mater, which we see in persons who have
died of jaundice, is probably only an apparent exception;
since the yellow colour may be situated in the fibrous
structure, rather than in the serous membrane which
invests it.

All the products of the inflammation of serous mem- Contraction
branes, which are capable of becoming organized, have a and dimi-
nished vas-
strong tendency, after a time, to contract. Their new cularity of
old false
vessels contract with them; and many are either wholly membranes.
obliterated, or become incapable of conveying red blood.
Hence the new material, which once appeared of a bright-
red colour, and highly vascular, subsequently becomes pale
and blanched. It sometimes becomes not merely pale, but Induration.
firm and dense, especially if not of the most plastic form;
and this dense product of inflammation gives the character
of induration, as an effect of that process.

The formation of long bands and bridles, which may at
first be thought to form exceptions to this rule, is in

faet perfectly subjected to it; since much more is lost
in breadth, than is gained in length. And, as we have
already seen, in the case related by Beclard, the bridles
may be ultimately divided. We then have shreds of
greater or less length, attached by one extremity only.
Examples of this kind are, I think, most frequent in the
pericardium.

<div style="margin-left:2em">Forms
which false
membranes
ultimately
assume :
1. Cellular.</div>

When the effusion has been in small quantity, but ex-
tremely diffused, and of the most plastic quality, it ul-
timately becomes, as I have already repeatedly stated, a
thin and loose cellular web; but I cannot agree with
Villermé in thinking that adhesions, when once formed,
become wholly removed in advanced age. He was led to
form this conclusion from observing that there were no ad-
hesions in the chests of several individuals who had lived to
about the age of an hundred. When the effused organizable
matter is in large quantity, and when, probably from the
admixture of opaque floeculent particles, the inflammation
has been protracted and chronic, the form ultimately as-
sumed is dense and semicartilaginous. It is highly probable
that the dense and semicartilaginous structure, which we meet
with in these cases, is not wholly derived from the product
of inflammation on the surface of the serous membrane, but
is, in part, the thickening of the membrane itself to which the
false membrane is intimately attached. Laennec considered
that this form was favoured by the admixture of the red
particles and fibrin of the blood with the product of inflam-
mation; but I confess that I know of no facts which induce
me to agree, on this point, with the high authority which I
have just named. I am rather inclined to imagine, that
when the inflammatory secretion in the serous membrane
has an admixture of a mucous character, this addition will,
if not too abundant, favour the production of a structure
somewhat cartilaginous. The dense and cartilaginous
products of inflammation occasionally become penetrated
with earthy particles, and pass into a state more or less

2. Semi-
cartilagi-
nous.

pproaching to ossification; but this happens much more
requently beneath the attached surface of the serous mem-
ranes, than on the internal or secreting surface.

The contraction of the organized product of inflammation,
o which I have already alluded, often gives rise to strange
leformity of the parts to which they are united. Laennec
vas the first who pointed out the remarkable retrocession
of one side of the chest which takes place when a patient
urvives and recovers from empyema. This he ascribed to
the absorption of the fluid; but, as I suggested to the Phy-
sical Society of this Hospital, in a Paper which I read on
the application of the stethoscope, in the year 1822, I be-
lieve the true cause to be the contraction to which I have
ust alluded. I am confirmed in this opinion from having
observed similar effects, where the cause, to which Laennec
refers, could not have operated.

Before quitting the general notice of the effects of in-
flammation within the cavities of the serous membranes, I
must notice the influence which pressure seems to exert in
diminishing the amount of the fluid part of the inflammatory
effusion. This is most strikingly seen in the case of the
pleura. When inflammation of this membrane is associated
with that of the substance of the lung, the latter does not
collapse, as in cases of simple pleurisy; and we find the
quantity of the solid product of inflammation dispropor-
tioned to that of the serum; in fact, the latter seems nearly
or quite absent.

Besides the effects which I have now described as the
results of inflammation on the secreting surfaces and in the
shut cavities of the serous membranes, there are others, no
less remarkable, which are to be observed on the attached
surfaces.

In speaking of the changes which inflammation produces
in this situation, I shall not attempt to examine the truth
of the opinions maintained by Rudolphi, that the seat of
inflammation is never in the serous membranes themselves,

Marginal notes:

Conse-
quences of
the contrac
tion of false
membranes.

Effects of
pressure, on
effusion.

Effects of
inflamma-
tion on the
attached
surfaces of
serous
membranes.

but rather in the organs which they cover; that the serous membranes are no more susceptible of inflammation than the epidermis; and that pleurisy, pericarditis, and peritonitis, are, in fact, inflammations of the lungs, heart, and abdominal viscera. Chaussier and Ribes have professed a similar opinion regarding the so-called serous inflammations, as affections of the immediately subjacent cellular membrane.

The state of the parts which the serous membrane covers has unquestionably an influence on the tendency which the serous membrane has to inflammation. This is seen in emphysema of the lungs, which seems to be almost an insurance against pleuritis; but I know of no arguments of sufficient strength to prove that the serous membranes are lined by an inorganic layer analogous to the epidermis; and shall content myself with the fact, that the products of inflammation are sometimes found upon one surface, and sometimes upon the other, as sufficient to warrant the division which I have made.

Sub-serous cellular membrane.

The cellular structure, by which the serous membranes are connected with and attached to the organs which they invest, is by no means equally liable to the changes induced by inflammation, under all the serous membranes; nor even uniformly so, under every part of the same membrane. When the cellular membrane beneath the serous is loose and abundant, its proneness to inflammation is most considerable; and, on the contrary, when the serous membrane is closely attached to the subjacent parts, and has very little cellular tissue beneath it, it much more rarely happens that any morbid action takes place on the attached surface. The character of these changes is also very much modified by the peculiar structure of the part, as well as by the mode of inflammation.

Infiltration of sub-serous cellular membrane.

One of the most common appearances of the kind of which I am now speaking, is, the serous infiltration of the cellular tissue. This is most frequently and remarkably seen, where the serous membrane is thin, and the cellular

structure beneath it particularly loose. Hence we have
the best specimens of it in the arachnoid; and in the tunica
vaginalis, about which the scrotum is well known to be
swollen by effusion, after injection for the radical cure.

When the effusion is something more than mere serum,
it exhibits varieties analogous to those which I described
as presented by the effusion on the unattached and polished
surface: that is to say, it is sometimes of a plastic and
organizable character; in which case, it is often limited to a
comparatively small part of the attached surface.   At other
times, it is somewhat puriform, and inorganizable; and
though often more conspicuously remarkable in one part
than another, it has no defined limits, and is generally ac-
companied by an extremely soft and lacerable state of the
cellular structure which it infiltrates.   This lacerability,
however, by no means bears a necessary and relative pro-
portion to the quantity and extent of the puriform effusion;
since we sometimes see it, to a remarkable degree, accom-
panying the mode of inflammation of which I am speaking,
when the effusion beneath the serous membrane is very
trifling.   The lacerability of the sub-serous cellular mem-
brane, like the change which takes place in the vessels of
the inflamed membrane, is the result of softening, as the
direct effect of inflammation.   I may notice, as offering
specimens of the former or more plastic form of the product
of inflammation, subjacent to a serous membrane, those
partial inflammations of the pleura pulmonalis which we see
accompanying inflammation, or tubercular deposit, in the
substance of the lungs; and in which the adhesion to the
pleura costalis is either very partial, or wholly wanting.
We see it also in the abdomen, accompanying inflammation
of the peritoneal coat of the liver, spleen, &c.   The pro-
duct of inflammation behind a serous membrane has, like
that which is formed on its free surface, a strong disposition
to contract, after it has become organized: hence it fre-
quently gives rise to the puckering of the surface of the
organ on which it is deposited.

Examples
of plastic in-
flammation.

Tendency
to the pro-
duction of
bone on the
attached
surface.

It is probably one of the effects of the particular position in which it is situated, that the material deposited by inflammation beneath the serous membrane is far more prone to assume a firm and dense structure than that which is produced upon its secreting surface. This density, and the covering afforded by the serous membrane, are, I believe, the principal circumstances which favour the deposition of bony matter beneath the serous membranes, in which situation it is by no means rare to find plates of this substance. The consideration of this curious fact would lead me into the subject of the formation of bone, and more particularly of its accidental production : which, as it would occasion too long a digression from the subject more immediately before us, must be reserved for a future opportunity.

Examples of
non-plastic
inflamma-
tion.

The opposite state, in which the effusion is more or less puriform and widely diffused, and the cellular structure very lacerable, is found in conjunction with the turbid, puriform, and little organizable effusion into the cavity of the serous membrane : hence we find it in cases of puerperal peritonitis. Dalmas jun.. who has written especially upon the affections of the cellular structure, subjacent to the serous and mucous membranes, attributes this condition of the subperitoneal cellular tissue, in puerperal peritonitis, to the distension and elongation of the cellular membrane occasioned by the developement of the gravid uterus. Yet the occurrence of the same thing, in connection with the same form of peritonitis in males. proves that this distension, though it may assist as a predisposing cause, is by no means an essential condition. The best examples of this form of inflammation in males may be seen in peritonitis following stricture and other diseases of the urinary organs, lithotomy, and accidental injuries of the abdomen.

Primitive
affection of
the sub se-
rous cellular
tissue.

The sub-serous cellular membrane is not merely the seat of morbid actions propagated to it from the serous surface which covers it. It is itself liable to be primitively affected. It affords the bed in which commence those adventitious deposits which have been described as steatomatous, scrofu-

lous, cancerous, fungoid, and melanoid tumors and tuber-
cles of the different serous membranes.   Hydatids are
likewise found in this structure.

Gangrene is an extremely rare termination of inflamma- Gangrene
of serous
membranes.
tion in any of the serous membranes, especially of idio-
pathic inflammation.   Lieutaud has mentioned one instance
in the pericardium; and the highly offensive and discoloured
condition of effusions into some of the serous cavities, de-
scribed by Bichat, was probably attended with a state of
membrane approaching to sphacelus.   I cannot say that I
have ever seen an unequivocal instance of gangrene of a
serous membrane, except when it was either propagated
from the adjoining structures, or the effect of accidental
injury.   We have an example of the first of these, in gan-
grene of the lung ; and of the second, in strangulated her-
nia.   It is by no means uncommon to find both the serous
membranes, and the false membranes formed upon them, of
a very dark colour ; but this is of a different nature from
gangrene, and is to be carefully distinguished from it.   It
depends on an altered condition of the blood in the minute
vessels ; and is apparently most frequent in situations in
which inflammation or irritation had at one time existed,
but had subsequently subsided.   Or it may even be deci-
dedly cadaveric ; and depend on altered blood, either in its
vessels, or extravasated, or transuded.

The morbid appearances connected with the serous mem- Effects of
scrofula on
the serous
membranes.
branes, and referrible to scrofula or struma, are not con-
fined to the production of distinct collections of a scrofu-
lous deposit in the cellular membrane on the attached sur-
face of the serous.   Besides these isolated collections, we
meet with other phænomena, both on the unattached surface
and in the membrane itself.   On the smooth, unattached
surface, collections of tuberculous or scrofulous matter,
varying in size, number, and figure, are sometimes found
dispersed through the substance of recent false mem-
branes, the production of ordinary inflammation.   There are

other cases in which the whole of the adventitious deposit
is so modified by the strumous diathesis, that, instead of the
ordinary false membrane, we meet with a material known
by the name of tuberculous, in the sense in which this word
is used to designate the character of the material rather
than its particular form. As I shall hereafter have occa-
sion to call your attention especially to the consideration
of tuberculous matter in the sense in which the term is
here employed, I shall not discuss the subject on the pre-
sent occasion, farther than to observe, that in an early
stage of this deposit upon the unattached surface of a
serous membrane it forms a concrete layer, possessing
some degree of translucence, but wanting the lamellar
form of the plastic product of inflammation, and rather ex-
hibiting a peculiar shortness and friability. At a later
stage, instead of a semitranslucent layer, we find an opaque
substance, presenting some shade of yellowish white; in
fact, assuming the character of what is called crude tuber-
culous matter, and generally coincident with other va-
rieties of this deposit in other parts of the body.

From the thinness, as well as firmness of the different
serous membranes, we could scarcely expect to find tuber-
cles or other deposits developed to any considerable extent
in their very substance. We nevertheless occasionally meet
with examples of what are termed miliary tubercles, in this
situation.

Malignant
disease.

The different varieties of malignant disease, when they
attack the serous membranes, are almost exclusively con-
fined to the sub-serous cellular membrane already noted as
forming the nidus for their developement; yet we may oc-
casionally find minute bodies, having the character of
schirrus in the substance of serous membranes, in indivi-
duals who are known to be contaminated with malignant
disease. It is a very rare occurrence to meet with any
thing bearing the character of malignant disease upon the
unattached surface of a serous membrane; since, when the

presence of these diseases upon the attached surface has
induced any derangement on the free surface, this gene-
rally assumes the character of ordinary inflammation.   I
have however, in very rare cases, met with appearances
which I regarded as allied to fungoid disease upon the
unattached surface of the peritoneum.   Melanosis is de-
scribed as affecting the surface of the serous membranes;
but I believe that there is a fallacy in this respect, similar to
that which I noticed, when speaking of the gangrene of
the serous membranes.   I shall advert to this subject on a
future occasion.

Hydatids may occasionally be found in the cavity of
serous membranes; but, in such situations, their presence
can only be regarded as accidental, and consequent on
their escape from the seat of their production, which, in the
majority of cases, is the sub-serous cellular membrane.   In
this situation they frequently give rise to tumors of enor-
mous size, and possessing sufficient interest to claim atten-
tion in a future Lecture.

The common effect of local injury to a serous membrane
is the production of inflammation; but as I have already
noticed several of the peculiarities of traumatic inflammation
of the serous membranes, I have nothing further to add on
this subject at present; except the observation, that wounds
penetrating these cavities are apt to develope a form of
inflammation characterized by the want of plasticity of the
product; and to this circumstance I am inclined to refer
some of the conclusions at which those have arrived who
have investigated the subject by means of experiments in
which traumatic inflammation was induced.

Bichat has remarked, that it is rare for one serous mem-
brane to communicate its inflammation to another.   It is
certainly true, that we frequently find the traces of extensive
and long-standing pleuritis without any appearance of in-
flammation, either of the pericardium or peritoneum.   We
may also have extensive peritonitis, without either the

pleura, the pericardium, or the tunica vaginalis being at all affected. At the same time, Bichat's rule is by no means free from exception. There are probably few persons who have had extensive opportunities for witnessing inspections, who have not observed how often the traces of inflammation, either old or recent, exist, concurrently, at the base of the right lung, and on the convex surface of the liver. The same thing is observable, though less frequently, with respect to the left pleura, and the peritoneum in the neighbourhood of the spleen.

Connection between rheumatism and inflammation.

Although the serous membranes may be prevented from communicating their morbid actions to each other, by a want of continuity of tissue, and in some instances by a want of contiguity, they are nevertheless linked together, by an inexplicable, but indubitable sympathy. Hence, either the morbid affection which has been excited on one, may be propagated to another ; or the same general exciting cause may act on two, or more, simultaneously, with sufficient force to induce disease. You must all be well aware how often it happens, that, in rheumatism, the inflammation of the synovial membrane is followed by pericarditis. At other times it is the pleura, as I have myself witnessed, which is thus affected. My friend Dr. Foville has informed me, that he has seen rheumatism of the joints subside on the sudden production of hydrocele ; and, vice versâ, the cure of hydrocele succeeded by the appearance of rheumatism.

Connection between Dr. Bright's kidney and serous inflammation.

There is a particular derangement of the structure of the kidneys ably described by Dr. Bright, who first particularly pointed it out. In conjunction with this state of the kidneys, there is frequently (as he has shewn) a disposition to inflammation pervading the serous membranes in general. It is probable, that this is, in part, attributable to the hydropic effusion, to which this state of kidney predisposes, becoming an irritating cause.

A proof of the morbid sympathy existing between the

serous membranes may also be seen when they are af-
fected with cancerous or fungoid tubercles. When
growths of this kind have been formed about the peri-
toneum—which, of all the serous membranes, is the most
liable to them—you will not unfrequently find a sprinkling
of the same kind about the pleura, and, more rarely, about
the pericardium.

These conclude the remarks which I have thought it ne- Conclusion.
cessary to offer respecting the serous membranes gene-
rally; and in the ensuing Lectures I shall solicit your atten-
tion to the morbid appearances of some of these membranes
in particular. In doing so, I shall not merely be bringing
forward the proofs and illustrations of the principles which
I have endeavoured to unfold, but I shall also have occa-
sion to point out various modifications and peculiarities
presented by each.

F

LECTURE III.

ON THE SEROUS MEMBRANES.

THE ARACHNOID.

GENTLEMEN,

Your attention has hitherto been directed to the morbid phænomena which are common to the serous membranes as a class; but there are circumstances which render it neces-sary to consider each membrane separately. Any one of the serous membranes may exhibit all the appearances described in my last Lecture; but you will find that each of these mem-

branes is, in some measure, individualized by the frequency
or rarity with which it exemplifies certain conditions. I
shall first bring under your notice the morbid anatomy of
the arachnoid, which presents several remarkable peculi-
arities.

A deficiency of this membrane, either total or partial, is Deficiency.
a rare occurrence. The former is, of course, met with in
conjunction with absence of the brain in acephalous fœtuses.
The latter may occur where there is deficiency of part of
the brain, or irregularity in the ventricles; or where the
falx is wholly or partially wanting.

An excess of arachnoid is rather less uncommon than a Excess.
deficiency. We have examples of it in hernia cerebri; in
which it sometimes happens, that not only the arachnoid
covering the surface, but the portion also within the ventri-
cles, is prolonged into the protrusion.

The variations with respect to the secretions of this mem- Altered se-
cretions.
brane consist in their being sometimes extremely scanty,
leaving the surface of the brain almost dry; or, on the other
hand, in the more frequent, and, as it would appear, the
more serious affection of a morbid increase, constituting
hydrocephalus; which, however, seldom takes place, except
as a result of inflammation. The serum may also be tinged
with bile or blood; and there are other alterations in this
secretion, which are the results of an inflammatory process,
and will be noticed in their proper place.

In describing the results of inflammation of the arachnoid, Results of
inflamma-
tion.
it will be most convenient and correct to treat of the dif-
ferent portions of this membrane separately. I shall there-
fore consider the arachnoid as consisting of four portions:
of which, the first comprises that which is external to the Division of
the arach-
noid into
four por-
tions.
brain; the second, that which lines the ventricles; the
third, the portion which belongs to the plexus choroides;
and the fourth, that of the spinal cord. Dr. Foville, whose
researches respecting the brain justly entitle him to be
placed in the first rank of cerebral anatomists and patho-

logists, in his article ' Meningites,' in the *Dictionnaire de
Médecine et de Chirurgie pratiques*, treats of the inflamma-
tion of the arachnoid in a different order.   He considers,
first, inflammation of the parietal arachnoid which concerns
that part of the arachnoid which lines the dura mater ; and
which he connects with the inflammation of that membrane,
and of the intervening cellular tissue.   Under the simple
designation, Arachnitis, he places those cases in which the
product of inflammation is found between the smooth sur-
faces of the arachnoid, lining the dura mater, and that co-
vering the pia mater ; that is to say, in the cavity of the
arachnoid.   The third division he calls Cerebral Meningi-
tis.   It comprises those cases in which the product of in-
flammation is found infiltrating the pia mater, and to which
the name Piitis has been given by some pathologists ; and
also those, in which the inflammatory effusion is found within
the ventricles.   This division of the subject is excellent
and practical, from its conformity with the different assem-
blage of symptoms met with during the progress of the
disease, according as one or other of the portions referred
to is the seat of inflammation.   I prefer, however, retaining
the arrangement which I had adopted long before that ar-
ticle was written ; not only as more accordant with the plan
adopted with regard to other serous membranes, but as
affording equal or greater facilities for the description of the
appearances which I have to review.

THE ARACHNOID EXTERNAL TO THE BRAIN.

The product of the inflammation of this part of the arach-
noid is much more frequently purely serous than that which
results from the inflammation of the other serous mem-
Inflamma-
tory effu-
sion rare
within the
cavity of the
arachnoid ; branes. Whilst, in most of these, the inflammatory effusion
is generally found within their close sacs, in the arachnoid
it is extremely rare to meet with the effusion, whatever may
be its character, between that portion which lines the dura
mater, and that which is next to the pia mater, and covers

the surface of the brain.   Villermé says, he has never seen an instance of the kind.

The occurrence of the product of inflammation, whether false membrane or puriform effusion, between the polished surfaces of the arachnoid, is more especially rare in those cases of arachnitis which are not traumatic; yet we both infer, from analogy, that such a deposit may take place without being the result of external injury; and we have also authority for stating, that it has actually been observed. I had myself long been fruitlessly seeking for an example, not traumatic, of this form of arachnitis, when a case of the kind presented itself.   A young man, aged 23, had, for several months, been labouring under lumbar abscess. He never manifested any symptoms of affection of the head, until between four and five hours before the time of death.   On inspection, besides other very interesting appearances, which it is needless here to describe, small but sufficiently evident and unequivocal recent adhesions were found between the arachnoid covering the dura mater, and that covering the pia mater.   The far greater part of the effusion was, however, in the usual situation, beneath the arachnoid covering the pia mater : it was of a light yellow colour, and of a thin puriform consistence.   It must not however be concealed, that, even in this case, the arachnitis appeared to depend on a local cause, which, though at a distance from the head, was nevertheless in a part most intimately connected with it.   The lumbar abscess had formed a communication with the spinal canal through the foramina of conjugation by which the nerves pass out.   It was indeed suspected that the puriform fluid found in the spinal canal, and within the cranium, had been derived from the lumbar abscess, and not from the inflammation of the cerebro-spinal membrane.   I am however more inclined to believe, that though some of the fluid in the spinal canal may have been derived from the abscess, the principal effect of the communication had been to excite a general arachnitis.

The adhesions which I have mentioned—the presence of the fluid on both sides of the membrane— and the recollection of a very similar case of arachnitis from injury of the spine, but without any accompanying abscess, lead me to the opinion which I have stated.

Another example of the product of the inflammation of the arachnoid occurring between its two polished surfaces is recorded by Rostan. In a patient who died in the Salpétrière, at the age of 64, who was originally rachitic, and who had twice been attacked with apoplexy, the last seizure of which took place eleven days before her death, a layer of puriform and albuminous matter, differing from half a line to a line in thickness, was found covering the surface of the arachnoid lining the dura mater in both of the temporal fossæ, and in the anterior and lateral part of the right hemisphere. It is expressly stated, that this layer had all the characters which belong to those found on the internal surface of the pleura.

Dr. Foville, in the article to which I have before alluded, gives the result of six cases, in which the product of inflammation existed within the cavity of the arachnoid. Two considerable layers of false membrane extended over the whole of the internal surface of the arachnoid lining the dura mater and the external surface of that covering the brain, and were applied to these two surfaces; to which they were so slightly attached, as to admit of ready separation from them. They presented a considerable and uniform thickness, a good degree of firmness, and were of a yellow colour. There were but slight and partial adhesions between their opposed surfaces. There were thus four distinct membranous layers external to the brain: 1. The dura mater, with its serous lining; 2. The layer of false membrane corresponding to it; 3. A similar layer corresponding to the surface of the arachnoid investing the brain; and, 4. This portion of the arachnoid with the pia mater. The striking resemblance observable between all

these cases induces Dr. Foville to believe that there is a
special tendency to produce this form, whenever inflamma-
tion extensively affects the free surface of arachnoid.   The
distinctness and uniform diffusion of the two layers of false
membrane he thinks attributable to the movements of the
brain; and he points out the analogy to some cases of peri-
carditis, in which a similar disposition occurs.   In all these
cases of arachnitis, there was some effusion between the two
layers of false membrane.   In some, it was of moderate quan-
tity, and in others more considerable.   In the last case
which the Doctor has met with, a considerable quantity of
blood had been effused, which caused the patient's death.
All these cases had commenced by an acute cerebral attack ;
which, in one instance, occurring in an old soldier, had
been caused by a violent blow on the head.   In the other
instances he had not been able to ascertain the cause.
There was a similarity in the symptoms presented before
death in all these cases, in several of which they had existed
for years. They exhibited a state of the most complete stu-
pidity, accompanied by an apparent paralysis of nearly all the
organs of sense.   The patients actually resembled statues ;
with this difference, that when pushed, they walked ; when
set upright, they kept their balance ; and when food was
put into their mouths, they swallowed it.   Their eyes, eye-
brows, and other parts of the face, remained perfectly mo-
tionless.   The sensibility of their skin appeared mechani-
cal ; for if a limb were pinched, they would withdraw it,
but without any other evidence of suffering.

Films of false membrane, the result of inflammation, have
been repeatedly observed, by Dr. Guersent and Dr. Foville,
in the temporal fossæ, and other parts at the base of the
brain in children.   Dr. Foville appears to have repeatedly
met with very thin and partial false membranes about the
crura cerebri and the pons Varolii ; and he does not limit
this observation to children.

Dr. Fo-
ville's ob-
servations of
false mem-
branes in
the arach-
noids of
children.

A puriform secretion on the smooth surface of the

arachnoid is much less rarely met with, as a consequence of
injury.   Two cases of this kind are related in the fifty-first
epistle of Morgagni; and I could easily have cited others
from different authors, had I thought it necessary; but it is
needless to go further than our own wards.

Case of
traumatic
arachnitis
with puru-
lent effu-
sion.

A lad of eleven years of age was brought into Accident
Ward, under the care of John Morgan; having received a se-
vere injury of the head, by contusion between two carriages.
He survived the accident about two days.   There was con-
siderable injury to the scalp, and fracture with depression of
the bone; for which he was trephined, with immediate, but
partial and temporary relief.   On the right side, that on
which the fracture had taken place, there was found, after
death, a large quantity of thin pus, or puriform fluid, between
the arachnoid lining the dura mater, and that covering
the brain.   On the left side there was a small quantity of
pus beneath the arachnoid.   A similar case occurred in the
same ward, in an adult, a patient of Charles A. Key.

Adhesions between the two surfaces of the arachnoid are
of course extremely rare.   We nevertheless sometimes meet
with them, but chiefly when there has been some persisting
local cause of irritation and pressure, as, e. g., after injuries
of the head, and in conjunction with fungoid and other
tumors.

Appearances, the result of inflammation on the attached
surface of the arachnoid, especially on that which is in con-
tact with the pia mater, are as frequent as we know that they

Morbid
anatomy of
acute me-
ningitis.

are rare on the polished surface.   It is in this situation
that we are accustomed to look for, and find, pathological
appearances, in those cases of acute disease which are
marked by a high degree of fever, by pain of head, de-
lirium, convulsions, and often, ultimately, by coma; symp-
toms which, in children, are recognised as indicative of
acute hydrocephalus; and, in adults, of brain-fever, phre-
nitis, or rather meningitis, if the practitioner be acquainted
with modern pathology.   It may excite surprise that

inflammation of the membrane covering the brain should thus appear the principal cause of the disturbance of the intellectual faculties; since the brain, and not its membranes, must be regarded as the structure in the nearest relation to those faculties. But it is obvious that the cellular structure of the arachnoid covering the brain, or, in other words, the pia mater, owes its notoriously high degree of vascularity to the multitude of vessels which ramify through it in their course to the surface of the cortical substance of the brain, and which do not enter that organ until most minutely subdivided. Now the researches of Drs. Foville and Delaye have pointed out the cortical substance of the brain as the part of the organ most closely connected with the intellect. It is therefore perfectly reasonable that the form of arachnitis which we are now considering, should be accompanied with some disturbance of this part of the brain, and consequently be marked by the symptoms enumerated. It is more surprising, that, in some instances, the effect produced on the mental faculties is so slight, as scarcely to be perceived.

Though, after the most active symptoms of arachnitis, we often find nothing but serum infiltrated behind the arachnoid, we at times meet with a coagulable effusion, and, rather more frequently, with one that is puriform. Rostan has given several cases of puriform effusion beneath the arachnoid, in cases of idiopathic arachnitis. Other cases are given by Cruveilhier; and I have also repeatedly met with the same thing. Some of these examples are recorded and figured in Dr. Bright's splendid work.

Products of inflammation between arachnoid and pia mater.

When the product of inflammation beneath the arachnoid covering the brain assumes a puriform appearance, it frequently has a greenish hue, which in some instances is so strongly marked as to constitute a leek green. When the effusion infiltrated in the pia mater is only partial, it is nearly or quite confined to the sulci between the convolutions, and more especially to the course of the large vessels, where it forms an irregular line at each side of them. It

may therefore be supposed that it is in these situations that
the change from the serous to the puriform character com-
mences. The presence of the vessels, as well as the greater
thickness of the pia mater, may be concerned in producing
this effect.

Dr. Foville's description of the anatomical characters of
this form of arachnitis, which, as has been already stated, is
designated by him cerebral meningitis, is so good, accu-
rate, and concise, that I cannot do better than give it, as
nearly as possible, in his own words. " The anatomical
characters of meningitis are furnished," as he observes,
" by the pia mater, by the arachnoid, and by the surface of
the brain. The earliest stage is characterized by the deli-
cate injection of the most minute vessels of the pia mater.
The injection is so general, that it causes the external sur-
faces of the brain to appear of an extremely bright red, after
a few minutes' exposure to the air. The transparent serum
naturally pervading the pia mater has become very scanty,
and in some cases appears to be wholly wanting. The
free surface of the arachnoid has neither the polish nor the
moisture which it presents in its healthy state, but is slightly
viscid, and sometimes dry and dull: the membranes are
very readily torn, and are therefore detached in small frag-
ments, which makes it tedious and difficult to separate them
from the brain. The surface of the brain is manifestly red-
dened, minutely injected, and sometimes swollen in a
remarkable manner. The redness is rendered most con-
spicuous when very thin slices are cut from the surface.
There is sometimes such a deficiency of moisture in the
brain, that the membranes appear to adhere to it; yet a
little attention will convince us that this appearance is de-
ceptive, and that it simply depends on the viscidity of the
brain to which they are applied at those spots on which
they are the most firmly pressed together. Such are the
appearances observed in those rare cases in which death has
quickly carried off the patient in the first period of acute

meningitis." In the later stages, the injection of the pia mater
continues, but the fluid beneath the arachnoid, becoming of
a milky colour, and of a greater density, presents the puri-
form character with the appearances which I have before
described. The Doctor points out the fissure of Silvius as
the part at which the puriform character is most frequently
met with. The first stage which the Doctor has described
must in some instances be of brief duration; since, after a
very short illness, well-marked puriform effusion may be
found beneath the arachnoid.

In a patient who died in this hospital, affected with
arachnitis, which supervened on an accident by which
he received a slight wound of the occiput and a more
severe injury to the cervical vertebræ, we found beneath
the arachnoid a considerable quantity of yellow serum,
and some soft coagulable matter in the form of a thin and
recent false membrane. In this, as in almost every case of
arachnitis, the membrane had partially lost its transparency,
and appeared to be somewhat thickened. Opinions are *Opacity of arachnoid.*
divided with respect to the nature of this opacity of the
arachnoid; some persons regarding it as the result of mace-
ration in the effusion, whilst others hold it to be a more di-
rect effect of inflammation. Both opinions are probably
founded in fact; but I am inclined to think that the latter
is more generally the correct one. I believe it to be often
one of the traces of an arachnitis of an old date or chronic
character. I have observed such opacity to be most con-
siderable in that part of the arachnoid which corresponded
with the sulci between the convolutions of the brain; and
in that situation I have seen the thickening of the arachnoid
assume a mottled or minutely spotted appearance.

As another result and evidence of a long-past or chronic *Increased thickness and firm-ness of arachnoid.*
arachnitis, may be mentioned the increased thickness and
firmness of the arachnoid and pia mater conjointly, in which
state they may be separated in large portions from the con-
volutions of the brain: it must however be observed, that

this easy separation is not always solely ascribable to the cause just alluded to, since it may be promoted by the abundance of serum infiltrating the pia mater, or by the state of the surface of the brain itself; as, for example, in those cases in which it is the subject of atrophy. Thickening of the arachnoid and pia mater, carried to a considerable extent, is most frequent at the base of the brain, about the medulla oblongata, pons Varolii, and pons Tarini, where the arachnoid is sometimes seen almost resembling parchment. In some of the situations just mentioned, the thickening of the arachnoid and pia mater is so far from being readily separated from the subjacent brain, that it is with more than usual firmness attached to it.

We always, I believe, find some opacity of the arachnoid and small particles of opaque white substance upon the arachnoid covering the pia mater in the immediate vicinity of the longitudinal sinus. This, in general, is not to be regarded as a morbid appearance; but, when the white opaque substance is in much larger quantity than usual, and accompanied with greater and more extensive opacity of the membrane, I feel disposed to attribute it to chronic or ancient inflammation; and some cases, which I have met with, tend to confirm this idea.

Collections of serum beneath the arachnoid.

A large quantity of serum is sometimes found beneath the arachnoid covering the brain, in cases in which, if inflammation had been the cause, it must have been of a very chronic character. The fluid may be found collected at a particular part, and the form of the brain may be greatly modified by its presence. In one case which I saw in the Salpétrière, several ounces of serum were collected beneath the arachnoid, covering the anterior lobes of both hemispheres. The external form of the forehead in this subject was remarkably fine, whilst the brain, from the cause just assigned, was miserably deficient at the anterior part.

Ossific deposit.

It is an extremely rare occurrence for bony matter to be found beneath the arachnoid investing the brain. Dr.

Baillie has mentioned one example on the authority of Soemmering; and we have one specimen in our collection, in which a few small particles of bony matter were found in this situation.

Fungoid tumors are sometimes formed in the pia mater. I have seen them of about the size of a cob-nut, producing a corresponding depression upon the surface of the brain, which did not appear in other respects affected. In other cases, the substance of the brain has participated in the disease.

Fungoid tumors.

The extremely close and intimate connection between that portion of the arachnoid which lines the dura mater and this latter membrane is unfavourable to inflammation exhibiting its effects beneath this division of the arachnoid.

The effect of recent inflammation is rarely seen in this situation. Injuries of the head are among the causes most likely to induce it; but independently of such exciting causes, Dr. Foville mentions partial and irregularly circum-scribed elevations of this part of the arachnoid, sensible both to the eye and to the finger, and accompanied by a brownish or yellowish-red hue. When a portion of dura mater and arachnoid exhibiting this state is detached from the calvaria, and pressed between the thumb and finger, as they are made to move upon each other the two membranes are found to separate readily in consequence of the altered state of the cellular membrane between them, which, in fact, is the struc-ture chiefly affected. Bichat mentions a case of chronic inflammation of this part of the arachnoid, in which the membrane was sensibly thickened, and very easily detached from the dura mater.

Recent inflammation of dura-matral arachnoid.

Deposits behind this portion of the arachnoid afford the most striking instances of that disposition to ossification behind serous membranes to which I have already alluded. Ossific patches of this kind are, perhaps, the most frequently met with upon the falx; but they are often found between the arachnoid and the dura mater, lining the cranium. The

Ossific patches between arachnoid and dura mater.

most extensive specimen of this kind, which I have met with,
was taken from the head of an old man, who, from his in-
fancy, had been subject to hydrocephalus.

ARACHNOID OF THE VENTRICLES.

I have next to mention the membrane lining the ventri-
cles of the brain. This membrane has, since the time of
Bichat, been regarded as a prolongation of the arachnoid.
The present is not the place for going into its anatomical
relations; but whether they have been correctly given or
not, it is certain that this portion of arachnoid presents pe-
culiarities which entitle it to separate notice.

Whilst on the external surface of the brain we find the
arachnoid distinctly separated from the organ by the loose
cellular structure of the pia mater, and the two membranes
to all appearance only partially attached to the substance
of the organ by the vessels which they transmit to it, in
the ventricles the lining membrane is seen to be so insepa-
rably united to the surface which it invests, that its existence
as a distinct membrane sometimes cannot be demonstrated
Serous effu- without special precautions. This membrane may be the
sion in the
ventricles. seat of either acute or chronic inflammation. In both of
these states, there is often a copious effusion of a purely
serous character, constituting either acute or chronic hy-
drocephalus internus, in the same manner that the serous
effusion under the arachnoid covering the convolutions
constitutes hydrocephalus externus. This is the most fre-
quent effect of arachnitis affecting that part which lines the
Changed ventricles; and in conjunction with this effusion, the mem-
character of
membrane brane becomes thickened, semi-transparent, pulpy, and
accompany-
ing serous sometimes sprinkled with minute spots of blood. When
effusion. this form of inflammation has passed into the chronic state,
the increased firmness, as well as thickness of the membrane,
Coagulating becomes very evident. It is extremely rare to find flakes
lymph rare-
ly met with. of recent lymph accompanying the inflammatory effusion
within the ventricles of the brain; but as we occasionally

meet with old adhesions between the opposite surfaces of
the ventricles, it is possible that such flakes may be formed
to a trifling extent.   The adhesions of this kind have been
principally found between the corpus striatum and the op-
site side of the ventricle.

The inflammatory effusion within the ventricles is some- *Inorganiza-
times met with of the non-plastic character, when it assumes* ble effusion
sometimes
the appearance of a thin sero-purulent fluid. *seen.*

The surface of the membrane lining the ventricles is *Surface of*
the ventri-
occasionally sprinkled with very minute and tolerably firm *cular arach-*
elevations, as if it had been sprinkled with a small quantity *noid some-*
times sca-
of finely-powdered glass.   This appearance may be regarded *brous.*
as an instance of the scabrous form of inflammation of the
serous membranes, which I have already described.   The
small yellow particles which are occasionally met with, and
are chiefly situated on ridges—as, for example, upon the
peduncles of the pineal gland, and on the anterior commis-
sure—have probably a close alliance to the scabrous eleva-
tion which I have last noticed.

ARACHNOID OF THE PLEXUS CHOROIDES.

I am not aware that this part of the arachnoid is ever
absent, when the brain and its ventricles have existed ; nor
is it apt to deviate from its normal state, in being either too
small or too large, except that it sometimes becomes dis-
tended, in consequence of preternatural deposits within it.
The product of its inflammation on the free surface neces- *No marked*
character on
sarily becomes mixed with the secretion of the arachnoid *the free*
lining the ventricles.   It is consequently impossible to state *surface.*
what are its peculiarities, if it possess any.   I shall therefore
confine my remarks to appearances on the attached surface,
that is to say, in the substance of the plexus choroides.

From the abundance and size of the vessels in the plexus, *No evi-*
dence of
it might be supposed that this part would, under inflamma- *much effu-*
tion, give rise to a copious effusion : we do not, however, *sion from*
the cho-
find this to be the case on the attached, whatever may *roidal*
arachnoid.

occur on the free surface. This result is probably attri-
butable to the circumstance, that the vessels of the plexus
are rather in the condition of vessels *in transitu* to other
parts, than of those constituting an organ in which the blood
is elaborated for a particular purpose, as in glandular, mus-
cular, and some other structures. When serous effusion
takes place in the substance of the plexus choroides, it is
generally collected into small cysts, which give to the
plexus an appearance like that of a bunch of currants.
They vary in dimension, from the size of a millet-seed, to
that of a sphere of about one-third of an inch in diameter.
They rarely exceed this size; but Dr. Hooper, in his work
on the morbid anatomy of the brain, has figured a case in
which cysts of this kind are about two inches in diameter.
Of the symptoms occasioned by those bodies I am not pre-
pared to speak; but the presence of smaller cysts, and of
other morbid appearances of the plexus choroides, which I
shall presently notice, has generally concurred with such
symptoms of cerebral disturbance as the state of the plexus
choroides can have had little, if any, influence in pro-
ducing.

Cysts in the choroid plexus.

The plexus choroides occasionally exhibits numerous
opaque whitish points, diffused through the whole length of
the plexus. It is, however, more common to find the pro-
duct of inflammation collected at a particular spot, which is
almost always near to the commencement of the descending
cornu. In several cases, it has occurred on both sides, col-
lected in a well-defined body of the size of a barbary-berry,
or even as large as a horse-bean, of a yellowish white
colour, sometimes soft, and sometimes of a firm consistence.
These bodies are liable to become loaded with earthy mat-
ter, which gives them more the character of petrification
than of positive bone. The occurrence of these deposits,
exclusively, as it would appear, at one part, cannot be acci-
dental, but must depend upon some cause inherent in the
part; and I have imagined that this cause might be the

Opaque spots in the plexus.

turn which the plexus takes to reach the descending cornu; in making which turn, if the plexus be subjected to any motion, a slight degree of friction may take place. It has never occurred to me to meet with other deposits in the plexus choroides than those of which I have just spoken.

The plexus choroides is sometimes extremely exsanguineous and pale. I have been surprised to find this state repeatedly occurring in cases in which there had been a remarkable degree of cerebral excitement; and the idea has suggested itself, that the turgescence of other parts within the cranium may have prevented the vessels of the plexus from receiving the blood as usual.

Anæmia of the choroid plexus frequent after delirium.

The *velum interpositum*, a portion of plexus choroides beneath the fornix, has not often been noticed as the seat of morbid appearances. In some cases of arachnitis, I have seen this portion of membrane sprinkled with minute miliary tubercles, which appeared to be of a scrofulous character. It is by no means uncommon to regard the hydrocephalus of children as a scrofulous affection; but I must confess, that, except where the exciting cause has been the deposition of tubercular matter in the brain, it is rare to find anatomical evidence of scrofula in hydrocephalic heads, although there can be no doubt that the constitution denominated 'strumous' is that which is most disposed to this affection.

Velum interpositum.

I shall now conclude my remarks on the subject of the cerebral arachnoid, by noticing two or three morbid appearances connected with this membrane, and not usually referred to inflammation as their cause.

The first of these is the effusion of blood, which may either take place spontaneously, or from violence. From either of these causes it may be found, in any of those situations which I have described as occasionally occupied by the serous or puriform products of inflammation; that is to say, either upon its polished, unattached surface: or beneath that part which covers the pia mater;

Hæmorrhage into or beneath the arachnoid, from disease or accident.

or within the ventricles. It is needless that I should at-
tempt to offer a minute description of the appearances
which these effusions present; yet I may remark, that they
are often comparatively limited in their extent, rather than
diffused, from the point at which the eruption has taken
place, into situations to which we might have been tempted
to conceive, *à priori*, that they would have had free access.
Thus we may find blood on the surface of one hemisphere,
and not on the other; or filling one ventricle, and avoiding
the others; or, as I remember to have seen in one remarka-
ble instance, escaping from the veins of Galen, and diffusing
itself over the surface of the brain, but not entering the
ventricles, to which it appeared to have such ready access.
These effusions of blood very frequently give rise to soft-
ening of that part of the brain with which they are in
contact.

Hæmor-
rhage be-
tween the
dura mater
and arach-
noid.

There is another situation in which blood is occasionally
effused, and which, as it has been seldom noticed, requires
more particular mention. I allude to the posterior or at-
tached surface of that portion of the arachnoid which lines
the dura mater. Rostan has recorded three cases, in which
this form of hæmorrhage occurred to a considerable extent
in females somewhat advanced in years; and he describes
the symptoms which attended it, as bearing the closest re-
semblance to those of softening of the brain. In these cases,
the layer of blood, which had detached a considerable part
of the arachnoid from the dura mater, was of about the
thickness of a crown-piece.

Has the
dura mater
a lining
arachnoid ?

In speaking of the effects of inflammation exhibited on
the attached surface of the arachnoid, lining the dura
mater, I assumed that there was such a portion of the mem-
brane; reserving, till I came to the description of the form
of hæmorrhage which I have just mentioned, any allusion
to the doubts which have been held by some, respecting its
existence. The mere fact of the possibility of the occur-
rence of this hæmorrhage appears to me to be so strong a

proof of the existence of this lining, and consequently so interesting a phænomenon, that, in addition to the three cases which I have already mentioned on the authority of Rostan, I shall present you with the details of a fourth, which occurred in this hospital.

On examining the body of a mulatto, about fifty years of age, who had lain for some time in a nearly comatose state, a considerable quantity of fluid escaped on opening the dura mater. It appeared to have been situated between this membrane and the arachnoid covering the pia mater. Blood was thinly but extensively extravasated over a great part of the inner surface of the dura mater. This extravasated blood was most copious on the left side, but by no means confined to it. It was in the greatest abundance about the base, but was likewise seen on the upper part. It presented, for the most part, a smooth polished surface towards the arachnoid covering the pia mater ; and was covered by a thin, even, firm, and generally transparent membrane, which, in some parts, seemed to be double, having the effused blood between its layers. This delicate membrane could be nothing else than a portion of arachnoid reflected over the dura mater, and giving it its polished surface. Though very thin, it was too firm and resisting to be regarded as a false membrane formed from the fibrin of the effused blood. The dura mater, when this membrane was peeled off, lost its natural polish, and exhibited its fibrous texture. On different parts of the surface of the brain, but chiefly at the base, there were scattered irregular spots of an ochre-yellow colour, in which there was softening and loss of the substance of the brain; but these appearances only extended to a very slight depth. I have met with another case of this kind, in which the blood extravasated between the arachnoid and dura mater was in part diffused, and in part collected into small defined portions, forming elevations of about the size of peppercorns.

Case to shew the affirmative.

Farther evi-
dence that
the dura
mater has an
arachnoid
lining.
There are two other morbid appearances which occasio-
nally present themselves in the same situation; and which,
independently of their own particular interest, might be
appealed to, if further proof were wanting, in confirmation
of the existence of the arachnoid lining the dura mater.
The first of these is the production of scrofulous tubercles.
As I do not remember to have ever met with these myself,
I shall content myself with barely mentioning them, on
the authority of Dr. Baillie.   The second is the develope-
ment of fungoid tumors.   They are sometimes small, but
very numerous: in other cases, few, or even solitary, and
occasionally acquiring a large size.   The symptoms to which
they give rise, are frequently much less severe and consi-
derable than we might reasonably suppose that tumors of
their size, and in their situation, would be likely to excite.
Out of twenty cases mentioned by Louis, there are not
more than two or three which are noticed to have been at-
tended with any other symptom than pain of the head; but
this was observed to be obstinate and lancinating.   Partial
paralysis, and other symptoms referrible to pressure on the
brain, have sometimes been observed; but this has been very
rarely the case, in consequence of the slow developement
of the tumors.   In some cases, they appeared to have given
rise to epilepsy.   In most, if not all the tumors of this
description which I have had an opportunity of examining,
the structure has been of a more firm and fibrous character.
than that generally to be met with in similar formations
in other parts of the body.   The tumors mentioned by
Dr. Baillie, as spongy tumors growing from the dura
mater, belong, I believe, to the class of which I am now
speaking.

Fungoid tumors formed on the attached surface of the
arachnoid lining the dura mater do not merely raise the
former membrane and demonstrate its existence : they
sometimes occasion the absorption of the dura mater, and
ultimately the cranium, producing an external protuberance.

ARACHNOID OF THE SPINAL CHORD.

The unpublished researches of my friend Dr. Sharpey, respecting the distribution of this membrane, tend to shew that it is much more complicated than has hitherto generally been supposed. I am not prepared to give the details of the points which he has ascertained : and, were I so prepared, I should be unwilling to anticipate that learned and indefatigable anatomist in the publication of his researches. Yet, as elucidating and explaining some morbid appearances which we meet with, I cannot omit to state, that he finds four layers of arachnoid external to the spinal marrow ; namely, one lining the dura-matral sheath ; one investing the chord itself ; and, between these, there are two closely-applied folds, which are in general so thin and diaphanous, as to appear but a single membrane. There are, nevertheless, interposed between them, a few filaments of fibrous texture, which are most evident at the margin of the ligamentum denticulatum. The cellular membrane of the arachnoid, investing the medulla, and constituting its pia-matral covering, differs from the pia mater of the brain, in being less vascular, and much less loose and abundant ; but it closely resembles that covering the pons Varolii and medulla oblongata, with which it is continuous.

Dr. Sharpey's researches on the spinal arachnoid.

I am not aware of any instance of congenital deficiency of this part of the arachnoid. Some degree of contraction in it is occasionally induced, as a result of inflammation ; and, as such, will require further notice. A congenital excess of a part of this membrane is met with in spina bifida ; in which a sac is formed, lined by arachnoid, having, in some instances, three or four inches, or more, in diameter.

Deficiency and excess.

The secretion of the arachnoid appears to exist in the form of a serous fluid ; which is situated in its cavity, rather than on its attached surface. The principal deviations from the normal state of this fluid appear to consist in variations respecting quantity. Here, however, we should be aware of

Secretion of the spinal arachnoid.

sources of fallacy ; since the quantity may become apparently
excessive, in consequence of serum having made its way
from the head, where some form of hydrocephalus may have
existed. I believe, also, that the normal quantity may be
sometimes reduced or augmented by cadaveric infiltration ;
the one or the other effect taking place, according to the
general state of the body. Of the reality of the morbid in-
crease of this fluid there can be no doubt, when it concurs
with spina bifida, in which the sac sometimes contains seve-
ral ounces of serum. From the experiments of Magendie
upon the fluid in the spinal canal in dogs, it appears that
this fluid can be rapidly produced. The operation of tap-
ping, which has been performed in cases of spina bifida,
warrants the same conclusion in the human subject—at least,
under disease. We are acquainted with few deviations from
the normal character of this fluid : it is not unfrequently to
be met with sanguinolent, but this may generally be ascri-
bed to cadaveric transudation. It may, however, be mixed
with blood, either from apoplexy or accidental injury. It
may also be coloured with bile in jaundice, or rendered
puriform when the membrane is inflamed.

Inflamma-
tion of the
spinal
arachnoid.

Effects of
recent in-
flammation.

Inflammation of this part of the arachnoid is not of very
rare occurrence ; but it seldom happens that patients are
carried off at so early a period, as to allow of our inspecting
recent appearances. I have already noticed one case com-
plicated with arachnitis within the brain, and also one of
lumbar abscess, in which the fluid in the spinal canal assu-
med a puriform appearance. Such fluid is sometimes pro-
duced, independently of lumbar abscess, or any other source
external to the canal. It may therefore be the product of
the inflammation of the membranes of the chord ; yet I be-
lieve, that, even under inflammation, the secretion is much
more frequently serous than puriform. That a small quan-
tity of plastic lymph may accompany serous effusion from
the spinal arachnoid, seems to be rendered certain by the
old adhesions not unfrequently met with.

The effects of an arachnitis of old date or of a chronic character are not confined to adhesions between two surfaces originally free: we sometimes find such a deposition of plastic lymph, either in the form of cellular membrane, or reduced to a denser substance, that the membrane appears thickened, and the distinction of its original layers is nearly or quite impossible. In this state, the arachnoid is not easily separated from the medulla, which is closely embraced, and even compressed by the contraction which has taken place. This state of things is analogous to, and sometimes is the continuation of that condition of the cerebral arachnoid which I have mentioned as being met with at the base of the brain, about the pons Varolii and medulla oblongata. When the effects of arachnitis are found about the cervical portion of the cord, these two states are, perhaps, always combined; but I have also met with it at the lower part of the chord, where it may exist separately.

This thickening and contraction of the spinal arachnoid is well worthy of attention, in reference to practice. I believe it to be one of the causes of paraplegia, which must be more or less complete, according to the amount of compression exercised upon the chord; and that, when the case is not extreme, progressive improvement may take place, both by the chord becoming accustomed to its pressure, and also by the slow and partial absorption of the adventitious deposit, which, though not wholly removed, may thus become of a laxer and more yielding texture. These considerations seem to explain the progressive but slow improvement which we sometimes observe in cases of paraplegia; and should teach us to wait with patience, desisting from energetic measures, such as copious local depletion, deep and extensive setons, and other potent means of counter-irritation; which may not only be resorted to in vain, but may increase the dangerous sloughing of parts exposed to pressure, while deprived of their ordinary degree of innervation. At the same time, I wish not to be understood as recom-

mending that these cases, in their chronic state, should be
left wholly to nature. I am persuaded that I have seen ad-
vantage derived from the careful and persevering use of
means which are supposed to exert an influence upon the
spinal chord; such as, nux vomica, carbonate of iron, and
electricity, in conjunction with other means which the ge-
neral health may require.

Attached
surface of
the spinal
arachnoid.

In those cases of arachnitis of the chord in which the in-
flammation had not yet passed into the chronic form, I have
seen the vessels of the pia mater, at the affected part, consi-
derably injected; and in one instance, the blood had acquired
a blackish colour. Whether the arachnoid may have been
injured by mechanical violence, or by exposure to cold, it is
not uncommon to find the spinal chord itself more or less
affected; being either softened, or having its cineritious mat-
ter unusually injected. Sometimes it presents a vermiform
or granulated appearance; which may be attributed either
to the compression of the contracted arachnoid, or to the
turgescence of the affected part of the chord; or both causes
may be combined.

Cartila-
ginous
patches on
the spinal
arachnoid.

Small patches of cartilaginous or bony matter are some-
times found about the spinal chord, varying in size from
that of a mere particle, scarcely so large as a pin's head, to
that of one's finger-nail, or rather more. They also vary in
thickness, from that of a peppercorn to that of a melon-seed.
The situation of these patches is satisfactorily accounted for,
by the view which Dr. Sharpey has taken of the spinal arach-
noid; since it would seem that they are situated between
the two middle layers, and consequently upon the closely-
attached surface of a serous membrane. But for this expla-
nation, they would appear to form an anomaly, in being
situated where the arachnoid is loosely attached by the pia
mater. I am not aware of any instances of bony matter
being found between the dura-matral sheath of the spinal
chord and the arachnoid lining it: they have probably been
seldom sought for.

The cartilaginous and bony spots which I have been describing, are frequently met with in cases of tetanus, fatal chorea, and other diseases in which the spinal portion of the nervous system has been supposed to be affected; and it has been believed that the spots in question have been concerned as a cause: nevertheless, their occurrence in other subjects in which the symptoms were absent, and their absence in some cases of the diseases referred to, would seem to set aside the necessary connexion between the symptoms and appearances. At the same time, I have no hesitation in regarding these deposits as morbid; and, as such, in considering them as indications of such a want of integrity in the spinal chord as may predispose to tetanus, chorea, and the like affections.

LECTURE IV.

ON THE SEROUS MEMBRANES.

THE PERICARDIUM.

DEFICIENCY OF THIS MEMBRANE — EXCESS, CONGENITAL OR ACQUIRED — RESULTS OF INFLAMMATION—HYDROPS PERICARDII—VARIETIES OF ADHESIONS—DIFFERENT FORMS OF FALSE MEMBRANES—COPIOUS EFFUSION IN PERICARDITIS—LAENNEC'S DIVISION OF PERICARDITIS INTO TWO SPECIES—VARIOUS PRODUCTS OF INFLAMMATORY ACTION— SCABROUS APPEARANCE OF THE PERICARDIUM—OSSIFICATION ON THE ATTACHED SURFACE—OPAQUE WHITE PATCHES ON THE SURFACE OF THE HEART—TRAUMATIC PERICARDITIS—AUSCULTATORY SIGNS OF PERICARDITIS—GANGRENE—SCROFULOUS AND MALIGNANT TUMORS OF THE PERICARDIUM—HYDATIDS.

GENTLEMEN,

THE pericardium offers one of the best specimens of a serous membrane. The majority of the cases which have *Deficiency.* been related as instances of deficiency of the pericardium have, in all probability, been merely cases of pericarditis, terminating in universal and close adhesion; yet two undoubted examples, the one recorded by Dr. Baillie, the other by Breschet, leave no room to question the possibility of such a deficiency.

Excess congenital. I know of no example of congenital redundancy of the pericardium, unless the bridles and membranous bands, which are occasionally found to unite the two surfaces, are in some cases to be regarded as the result of original formation, rather than of subsequent inflammation. I do not myself incline to such an opinion: but as it has been adopted by some authors, it is necessary that I should advert to it. Tioch, in particular, regards adhesions of this kind, near to the apex of the heart, as congenital; and states, in support of this view, that, in certain reptiles, such a conformation is natural. We find an example of this form of pericardium in the iguana.

The pericardium may acquire, through disease, a preter- natural increase of its dimensions—

1. In hypertrophy of the heart.

2. When its cavity is distended by inflammatory or hydropical effusion ; and,

3. From the developement of aneurismal, steatomatous, scrofulous, malignant, or hydatid tumors.

Under the influence of inflammation, the pericardium exhibits most of the different appearances which I have described, in speaking of the serous membranes generally. Not unfrequently, it is reddened by an infinite number of minute vessels; sometimes, though rarely, its surface is preternaturally dry; and occasionally, air has been found in its cavity. It does not appear that the chemical composition of this gas has ever been examined. These states may, I conceive, be all connected with inflammation in a very early stage, except when the gas results from decomposed secretion.

The secretion of this membrane is sometimes preterna- turally increased, without any very sensible alteration in its characters. This increase constitutes hydrops pericardii; which, though often produced by an inflammatory process, may, like other dropsies, depend at times on an atonic cause. Bertin is probably correct in stating, that many cases regarded as dropsy of the pericardium are, in fact, cases of pericarditis: and Laennec has with equal truth remarked, that the two affections run insensibly into each other ; and that in the pericardium, as well as in the other serous membranes, we may occasionally find the membrane so completely of its natural appearance, the effusion so clear, and the previous symptoms so little indicative of inflammation, that the case would be unhesitatingly set down as purely hydropic, were it not for the presence of a few films of false membrane. Admitting, however, the deduction of the cases of pericarditis, there can be no doubt of the occasional existence of hydrops pericardii. In many cases,

the existence of fluid in the pericardium is, with the greatest
probability, to be ascribed to an effusion taking place just
before death, perhaps in the very agony.   At other times,
it appears to be merely a cadaveric phænomenon.

When inflammation has altered the quality as well as
the quantity of the secretion from the surface of the peri-
cardium, we have either the highly coagulable and plastic
product, or an effusion of a more puriform character.   The
former, as I have shewn, leads to the most perfect cellular
adhesions.

Adhesions
of the peri-
cardium.

Four va-
rieties of
these adhe-
sions.

Adhesions of the pericardium, Bichat has observed, pre-
sent at least four varieties in their appearance.   Sometimes
the surfaces of the close and of the reflected portions are
so intimately united, as to appear identified ; the bond of
union escaping observation.   Cases of this kind, as I have
remarked, have been mistaken for the absolute defect of
the pericardium ; and the detection of this error has led
into the opposite one, of denying that such a deficiency has
ever occurred.   In Bichat's second variety, the adhesion is
more loosely effected.   In the third, it is produced by a
multitude of filaments ; and in the fourth, by broad and
membranous layers.   The formation of bridles of adhesion,
connecting the opposed surfaces of the serous membrane, is
by no means an unfrequent result of pericarditis.

It is generally, and, I believe, correctly supposed, that
adhesions between the two surfaces of a reflected membrane
are always the result of an inflammatory process.   When
there is a considerable admixture of inorganizable mat-
ter, the production of adhesions is prevented; in which

Villous false
membranes.

case, the surface of the heart is not unfrequently covered
with long, shaggy, soft, and very feebly organized villi.   It
is this state of the heart which has, in all probability, led to
the idle and absurd stories of the heart having been found
covered with hair.   The heart of the great Messenian
hero, Aristomenes, is said to have been hairy ; and a similar
account has been given respecting the heart of Old Parr,

and of some other individual equally remarkable for his lon-
gevity. In other cases in which adhesion has been thus pre- Reticular false mem-branes.
vented, the surface of the false membrane has a reticulated
appearance, which Corvisart, Laennec, and Bertin, have
aptly compared to the inner surface of the *bonnet* or second
stomach of the calf: and Laennec has also likened the sur-
face of the false membrane, when in this state, to the ap-
pearance produced by quickly separating two slabs of mar-
ble which have been applied together, with a small quantity
of butter, or some similar substance, between them. Bertin
mentions a case, in which the coagulable part of the effusion
formed large and thick masses which were notched like the
comb of a cock. Both Laennec and Bertin speak of the
adventitious deposit producing an uneven surface re-
sembling a miliary eruption or small-pox pustules. They
were probably not the products of common inflammation,
but rather allied to scrofula or some of the forms of cancer.
I am the more disposed to this opinion, from the circum-
stance, that, in one at least of these cases, the mesentery
and the lymphatic glands were similarly affected. When
the matter of the inflammatory effusion is of the most inor- Purulent
ganizable kind, it has a very puriform appearance. Baillie effusion.
and Bertin have both noticed this form; and a similar case
is mentioned in an old record of an inspection made in
this hospital.

The fluid part of the effusion in pericarditis is, in some
cases, very copious. Corvisart mentions a case in which the
effused fluid amounted to eight pounds. Bertin details a
case of acute pericarditis, occurring in La Pitié, in which
the distended pericardium formed a bag seven or eight
inches broad, five deep, and ten or eleven in height. It
displaced the lungs on both sides, and a false membrane
increased the thickness of the pericardium to half an inch.
The sac contained a turbid serum, mixed with coagula,
which was of a most insufferably offensive odour. The
heart in this case was smaller than usual. The like

coincidence of a small heart with copious effusion into the pericardium has been noticed in other subjects; and Bertin believes that the effusion occasions the wasting or atrophy of the heart. The coincidence of a small heart with considerable effusion into the pericardium, is not universal; yet it can scarcely be doubted, that when the pericardium contains much fluid, the diastole of the ventricle must be impeded, and that, consequently, an apparent, and, in protracted cases, even a real diminution of the size of the heart may take place.

When the product of inflammation in pericarditis is of the inorganizable kind, whether it be solid or fluid, the disease is liable to become chronic and latent; and the close and reflected pericardium itself becomes thickened, and almost semi-cartilaginous, probably from deposit on both the free and attached surfaces, and also in the substance of the membrane. I have seen this effect in children and young persons. When thick and recent, the false membranes formed on the surface of the pericardium, and likewise of other serous membranes, are, at times, of a consistence resembling that of coagulated white of egg. It is to this circumstance, I imagine, that we must attribute the very general, but erroneous belief, that the coagulable part of inflammatory effusion consists of albumen. In the most plastic of these effusions, it is composed of fibrin, as Dr. Dowler has fully demonstrated. The chemical difference between this and the opaque inorganizable coagula has not, as yet, been either pointed out or examined.

It seems to have been the opinion of Bertin, that, when we find the coagulated effusion accompanied by little or no fluid, the watery part has been quickly absorbed. Laennec Effusion of believed that sometimes little else than coagulable matter is coagulable effused; and Dr. Baillie noticed the tolerably even diffusion of the coagulum over the surface of the heart, as demonstrative of the rapidity with which coagulation follows effusion : otherwise, he remarks, the coagulum would be

ound collected at the inferior part of the cavity. Such
collection at the lower part of a serous cavity not unfre-
quently takes place, as I have already stated in my general
remarks. The movements of the heart have, perhaps, at
least as much to do with the pretty general diffusion of the
false membrane over the surface of the organ, as rapidity
of coagulation. There is some analogy between these cases
and those of arachnitis related by Dr. Foville.

Laennec makes two forms of acute pericarditis. The one Laennec's two forms of
he calls *pericardite franche*, or simple pericarditis, in which pericarditis.
the effusion is merely a mixture of serum and coagulable
matter : it is the form the most favourable to a speedy and
salutary termination. The other he calls *pericardite hémor-
rhagique*, in which an exudation of blood accompanies the
other matter of effusion. This complication he regarded
as tending to render the affection chronic, and likewise mo-
difying the character which the product of inflammation
ultimately assumes, by favouring the formation of cartilage,
fibro-cartilage, or bone. Of the accuracy of the latter part
of this opinion, as I have already observed, I am not con-
vinced. The effusion of blood in pericarditis is probably
rather an effect, than a cause of the severity of the inflam-
mation. A slight admixture of blood not unfrequently ac-
companies many preternaturally increased exhalations and
secretions, whether inflammatory or not : it may be seen
in the perspiration from the skin, the mucus from the nose,
the urine, the secretion from the testes, and in hydropic
effusions, as well as in the inflammations of the serous and
the mucous membranes. The different appearances which
we meet with in the product of inflammation may more
correctly be referred to the plastic and to the inorganizable
forms of effusion to which I have particularly called your
attention in a former Lecture, and to their various combi-
nations. Hence, we have not only the two extremes of
delicate and perfect cellular tissue, and perfectly inorgani-
zable pus, but also cartilage, fibro-cartilage, a white, com-

pact, but pliant structure, not sensibly fibrous, and likewise
bone.   We may find most of these in conjunction with
adventitious cellular membrane.   In a specimen in which
one of these combinations is very distinctly seen, there are
three adventitious layers between the close and the reflected
portions of the pericardium.   The middle one is of a pliant
compact semi-cartilaginous structure.   On each side of this,
there is a thin layer of cellular tissue, by which it is con-
nected to the pericardium.   This state of things is most
readily accounted for, by supposing that the middle layer
was first formed, that it was but feebly organized, and that,
the fluid part of the effusion being absorbed, this layer was
in contact with both surfaces of the pericardium, until raised
and detached by a second attack of inflammation, which led
to the formation of the two cellular layers.   When the peri-
cardium has been the subject of inflammation, we sometimes
find the adventitious membrane raised by the serum beneath
it, so as to form vesicles or bullæ, which are often of consi-
derable length, in proportion to the breadth of their bases.
The margins of the heart, not far from the apex, are the
common situation of such bullæ.

The bridles or bands of adhesion between the opposed
surfaces of a pericardium which has been inflamed, are apt,
when they become organized, to exhibit vessels in straight
and parallel lines, producing some resemblance to muscular
fibres.

Acute pericarditis appears to be of by far the most fre-
quent occurrence in young persons just arrived at, or but
little past, the period of adolescence. It is probable that
the danger of pericarditis is commonly much overrated,
and that its comparative frequency is equally underrated.
Louis's researches lead him to the conclusion, that pericar-
ditis attacks, on the average, about one person in twenty.

Scabrous
form of in-
flammatory
product.

The pericardium is apparently more prone than any other
serous membrane to that form of inflammatory deposit which
leads to the production of minute firm elevations, resembling

the papillæ of the tongue, and occasionally rendering the surface of the membrane scabrous. I have seen examples of this form of pericarditis succeeding to a former attack of inflammation which had produced numerous bridles of ad- hesion. These bridles, as well as the surface of the close and reflected serous membrane, were covered with these papillæ.

Inflammation of the pericardium not unfrequently leads to a deposition behind the reflected, as well as on the close portion. Whilst on the free surface bony matter is of rare occurrence, and is seldom if ever found except in small iso- lated masses, on the attached surface the compact product of inflammation is apt to assume the form of bony plates. These cases, when the extent of ossification has been considerable, have been erroneously described as ossifica- tions of the heart; and they have, I suspect, been somewhat exaggerated, by those who have wished to find in them an argument in favour of the arteries possessing the power of propelling the blood, and, consequently, muscular structure and function. One of the most considerable examples, with which I am acquainted, is seen in a preparation belonging to our Museum. The osseous plate occupies a large portion of the base of the heart, where it forms a complete bony ring. The apex of the heart is, however, left at liberty; and, consequently, the contractions of the ventricles, though doubtless much interfered with, were by no means wholly prevented. It was taken from a young woman twenty-two years of age, who had laboured under ascites for ten months, and had been tapped ten times. The ascites was preceded by an attack of dypsnœa with orthopnœa, which subsided in a fortnight. No symptom connected with the thoracic viscera was afterwards noticed.

Ossification on the at- tached sur- face.

It is very common to find one or more opaque white patches on the surface of the heart. Dr. Baillie says that they may be dissected off; and Laennec says that this is fre- quently the case. I have met with one or two instances in

Opaque white patches on the surface of the heart.

H

which this might have been done; but I certainly agree
with Corvisart, in thinking that, in by far the greater num-
ber of cases, these patches depend on a deposit on the at-
tached surface. They are generally found on the anterior
part of the right ventricle, and rather nearer to the apex
than to the base of the heart. They are, however, by no
means confined to this situation. Respecting the cause of
these spots, which can scarcely be regarded as a morbid
appearance, nothing certain is known. From the circum-
stance of their being often found immediately under the
sternum, and from their being occasionally met with on
other parts of the heart to which a firm and resisting body
has been unusually opposed—as, for example, where a bony
deposit has taken place beneath the reflected pericardium,
or when an uneven and remarkably indurated liver has,
even through the diaphragm, presented an unequal pressure
against a particular part of the heart—I have thought it
probable that such pressure, aided by the movements of the
heart itself, may have led to the production of these spots.
These formations may certainly take place at a very early
period of life. I have met with one rather loose and thick,
but in other respects perfectly resembling those found in
the adult, on the right ventricle of the heart of a child only
ten weeks old. Similar thickening of the close pericardium
sometimes marks the course of the coronary arteries and
their branches; and this circumstance, amongst others,
tends to confirm the idea which I entertain, as to its mode
of formation.

Almost all the cases of pericarditis, which come under our
notice, are the result of disease, either originally commenc-
ing in the heart, or transferred to it from some other part;
often from synovial membranes affected with rheumatic in-
flammation. Instances however do occur, in which the
inflammation of the pericardium has been excited by mecha-
nical violence done to the membrane. The following ap-
pearances were observed in a case of this kind, which fell

*Conjecture
as to the
modes of
their pro-
duction.*

*Traumatic
pericarditis:
with case.*

under the notice of my friend Dr. Ferrus, of the Hospice de Bicêtre.

A man died twenty days after he had stabbed himself through the heart. The weapon, a small one, acting as a stiletto, remained in the wound, transfixing the left ventricle, and penetrating the cavity of the right. The pericardium contained ten or twelve ounces of reddish serum, of a fetid smell, and mixed with numerous discoloured fibrinous coagula. Some of these coagula adhered to the surface of the heart, and formed a sort of case for the organ. The pericardium was described as thickened, rough internally, and more vascular than usual. It is worthy of remark, that, in this case, the contractions of the heart had been accompanied by the sound designated, by Laennec, as the *bruit de lime*, or similar to the stroke of a file : it was likewise compared to the sound which may be heard over a varicose aneurism. It is true, that this sound may have been produced by the instrument lodged in the substance of the heart, and transfixing the left ventricle ; but I imagine that it may have been produced by the state of the pericardium. Collin, whose authority with respect to the indications obtained by the use of the stethoscope is scarcely inferior to that of his master, Laennec, has pointed out a peculiar sound, compared to the bending of new leather, which he has known to accompany some cases of recent pericarditis. Two cases of pericarditis, which occurred in this hospital, were accompanied by perversion of sound, which, in one of them at least, was a kind of *bruit de scie*, or sawing sound. In both, the pericardium was rough ; and, in that in which the *bruit de scie* was observed, it was covered, on both surfaces, with numerous minute papillæ. I am induced to mention these particulars, though I am aware that I am rather stepping out of my province in alluding to symptoms, because the facts appear curious, and may tend to explain some cases, in which *bruit de scie* had been noticed, and valvular disease had been erroneously predicted. It must not how-

Auscultatory symptoms in pericarditis.

ever be forgotten, that pericarditis, and perhaps rheumatic pericarditis most particularly, is apt to co-exist with effusion between the folds of membrane forming the valves, and that the sounds observed may occasionally depend on this cause; whilst, in other cases, they may be produced by extremely minute and tender deposits upon the surface of the valves.

Gangrene. Gangrene of the pericardium is an extremely rare occurrence. I can say nothing respecting it from my own observation; but some examples have been given by Lieutaud.

Bloody spots are sometimes found on the surface of the heart beneath the close pericardium, the effect of purpura rather than of inflammation.

Scrofulous and malignant tubercles. Scrofulous tubercles are very uncommon in or about the pericardium. Baillie mentions having seen three tumors of this kind, of about the size of a walnut. Tumors of the malignant kind, such as fungoid, cancerous, and melanotic, are sometimes, though by no means frequently, met with, affecting the pericardium: they are, as I believe, formed on the attached surface, and are generally accompanied by other tumors of the same description in different parts of the body; which circumstance will sometimes throw light on their nature. In one of the specimens of this morbid appearance contained in our Museum, the tubercles are of considerable size, and are marked by slight traces of a melanotic character. In the patient from whom this specimen was taken, the disease had made its appearance in many organs and tissues; and proved fatal, by affecting the spine. In another case, there are some decidedly melanotic tubercles beneath the pericardium as well as in the substance of the heart. Bertin gives a case, in which the pericardium was thickened, and covered with minute granulations, which appeared to be of a malignant character; and another, in which the pericardium was much thickened, and connected with a fungoid mass developed under the sternum. Acephalocyst hydatids have been found between the close pericar-

dium and the substance of the heart.   In a specimen of this
description presented to the Museum by my friend E. C.
May of Tottenham, there were acephalocysts of various
sizes, sufficient to fill a quart measure.   The sac containing
them was situated in part beneath the close pericardium, and
partly beneath the pleura pulmonalis of the right side.

LECTURE V.

ON THE SEROUS MEMBRANES.

THE PLEURA.

DEFICIENCY OF THE PLEURA—EXCESS.—RESULTS OF INFLAMMATION—APPEAR-
ANCES IN THE EARLY STAGE OF INFLAMMATION—FORMATION OF ADHESIONS
—SEMI-CARTILAGINOUS PRODUCT OF INFLAMMATION—EMPYEMA—NATURE
OF THE EFFUSION IN EMPYEMA—CHARACTERS OF TRUE PUS—PURULENT
EFFUSION MODIFIED BY CONTINUED CONTACT WITH THE SECRETING SURFACE
—SYMPTOMS OF EMPYEMA; AND ITS CONSEQUENCE, THE CONTRACTION OF
THE THORAX—SPONTANEOUS EVACUATION OF THE FLUID IN EMPYEMA—
BEST MODE OF PERFORMING PARACENTESIS THORACIS—ASSISTANCE OF THE
STETHOSCOPE IN EMPYEMA—OPENING OF EMPYEMA INTO THE BRONCHI—
PNEUMOTHORAX, AND UTILITY OF AUSCULTATION IN DIAGNOSING IT COR-
RECTLY.—WORM-EATEN APPEARANCE OF THE PLEURA—PARTIAL PLEURISIES
—DETACHED BODIES IN THE PLEURA—HYDROTHORAX, ATONIC, IDIOPATHIC,
AND SYMPTOMATIC—BLOOD IN THE PLEURA.—EFFECTS OF INFLAMMATION
ON THE ATTACHED SURFACE OF THE PLEURA — OSSIFICATION BENEATH
THE COSTAL PLEURA—CYSTS IN THE SAME SITUATION—GANGRENE OF THE
PLEURA—SCROFULOUS TUBERCLES—MALIGNANT DISEASE— HYDATIDS BE-
NEATH THE PLEURA.

GENTLEMEN,

Deficiency and excess. I KNOW of no case in which deficiency of the pleura is met with, except in monsters, in whom the lungs are either partially or wholly wanting. Excess of this membrane is also very rare. We have, however, examples of it; as when the lungs are divided into more than the ordinary number of lobes; and when prolongations of the pleura cover deposits of fat, of adventitious structures, large vesicles, and bullæ, and the like.

Altered secretion. In my general remarks, I had occasion to notice various lesions of secretion which are exemplified in the pleura; such as, dryness of the membrane, morbid increase of the fluid effused, and its assumption of a viscid, ropy, mucous character, which was frequently observed in those who had died of cholera. Sometimes the secretion of the pleura is

sanguinolent; at others, it is tinged with bile; and sometimes air is found in the cavity of the pleura.

The pleura is, of all the serous membranes, that which is the most liable to inflammation; and it affords a great variety in the appearances of the product of this process. The general remarks which I offered in my former Lectures had so decided a reference to the effects of inflammation as exhibited in the pleura, that it would occasion a tedious repetition, were I minutely to describe them, in reviewing the serous membranes particularly. *Results of inflammation.*

Like the pericardium, the pleura has been seen preternaturally dry. This is probably more or less the case at the commencement of every attack of pleuritis; but, as patients are very rarely carried off in this stage of the complaint, the phænomenon is seldom presented to our view. Medical authors have, it is true, frequently treated of dry pleurisies; but there appears to have been a want of accuracy in some of these accounts; and where this objection is unfounded, they refer to a state different from that to which I have alluded, but of which I shall hereafter speak. If inflammation continue, the secretion soon returns, increased in quantity, and altered in quality. The altered secretion may be produced with great rapidity. I have known the affected side of the chest become completely dull, on percussion, in the space of a few hours, and manifest dilatation follow shortly after. These changes, and an unequally increased vascularity, producing an appearance of minute irregular red points, are what we generally find in the most recent cases of pleurisy. Laennec agrees with Bichat, in thinking that, before death, the inflammatory redness is diffused and uniform. *Dryness of pleura.*

The morbid effusion admits of every variety, from the most plastic to the least organizable; the former producing adhesions, which, as in the case of the pericardium, are either extremely close and intimate, or loose, or filamentous. Adhesions of the pleura, of one or other of these forms, are *Pleuritic adhesions.*

the most common of all morbid appearances ; and are found, to a greater or less extent, in nearly all the bodies which are subjected to inspection.   These adhesions have, like those of the pericardium, been erroneously regarded as dependent on natural conformation, and called ligaments of the lung.   Vernojus advanced the truly ridiculous idea, that they were produced by laughing; and even the great Morgagni did not reject this opinion.   More recently, as Laennec tells us, some distinguished Professors of the School of Paris attributed them to a kind of destruction of the pleura.

Semi-carti-
laginous
product of
inflamma-
tion.

It is a circumstance of no very rare occurrence for the effused organizable matter to assume a semi-cartilaginous, instead of a cellular form.   This appears to be more particularly the case, when the inflammation has assumed a chronic form; which it is liable to do, when either the fluid part of the effusion is not duly absorbed, or when organization is retarded, and irritation kept up by the presence of inorganizable matter in the product of inflammation.   Hence, I believe it to be the common state of the product of inflammation, after the absorption of the fluid in empyema.   When this inorganizable matter is very abundant, and diffused through the fluid in the form of minute particles, which render it turbid, or even opaque and puriform, it constitutes empyema.   This disease has often very erroneously been attributed to the bursting of an abscess of the lungs into the cavity of the pleura; a circumstance, which, though it sometimes takes place, is certainly a very rare occurrence.   It may however happen, that a softened tubercle may be evacuated into the cavity of the pleura, instead of by the more usual course of the bronchial tubes; and thus become the exciting cause of pleurisy, and consequently of empyema.

Empyema.

The term empyema has been used in a very vague manner, and seems to have been applied to every form of effusion into the cavity of the chest. Thus we hear of empyema of blood, empyema of air, and empyema of pus. Empyema

has also been employed to designate the operation of tapping, to evacuate these collections in the thorax; and their spontaneous evacuation by a natural opening has been called 'empyema of necessity.' The term is now pretty generally restricted to the sense in which I have employed it; viz. to designate the collection of a puriform fluid in the bag of one or other of the pleuræ. This acceptation is most accordant with the etymology.

I have said, that the fluid collected in the affection of which we are speaking, is puriform; and you will perhaps think that there is something vague in this expression. I admit that there is a considerable vagueness, not merely of expression, but also of opinion with, respect to the pleuritic effusion of which I am speaking. Sometimes it is called pus, sometimes puriform, at others sero-purulent, or the like. This want of exact definition, it must be allowed, depends on the inherent difficulty of the subject. Notwithstanding the labours of Young, Home, Darwin, and many others, it cannot be said that we are yet possessed of a decisive and certain test for pus. Its misceability in water— its sinking in this fluid—the odour which it exhales when thrown on hot iron—various chemical re-agents; such as, sulphuric acid, muriate of ammonia, and oxymuriate of mercury — and the very ingenious optical test, with the eriometer — have all, more or less, failed in completely answering the purpose for which they have been proposed. Whilst, by some persons, and more especially by those who are partisans of the organizability of pus, this appellation is given to a great variety of products, from opaque concrete membranous flakes, down to a mere serum, rendered turbid by the intermixture of a few irregular minute particles, but becoming clear by rest and the subsidence of the particles; others restrict the term to the slightly-thickened, opaque, muciform, partieled matter of the kind produced by a healthy abscess; which, in its consistence, bears a considerable resemblance to cream, and shews no

Character of the effusion in empyema.

disposition to separation.   Its characters are then so marked
and decisive, that a mere inspection will generally suffice to
determine its nature ; and all the tests which I have men-
tioned will, if appealed to, almost invariably confirm the
decision. Were the particles contained in this secretion well-
defined and uniform globules, as some have asserted, we
should possess, in the microscope, infallible means of dis-
tinguishing true pus from those fluids with which it has, at
times, been confounded.   It happens, however, unfortu-
nately for these observers, that the particles contained in
pus, though generally smaller and much less variable in
size than those of the other fluids in question, are, never-
theless, very irregular in this respect, as well as in their
form, which is any thing but globular or circular.   Again :
true pus is liable to be disguised, in some of its properties,
by the secretions with which it may be mixed.   A striking
exemplification of this remark occurred to my friend C. A.
Key; who, having received, for the purposes of experiment,
some remarkably good-looking pus, obtained from an
abscess in the breast, was disappointed in most of the che-
mical tests he employed, but ascertained that coagulation
was caused by rennet. Here the properties of pus were un-
doubtedly masked by the milk with which it was mixed.

Pus dis-
guised by
admixture
with healthy
secretions.

I do not wish to restrict the use of the word 'pus' to
the product of the inflammation of the cellular membrane,
or of an abraded surface; and I confess my inability to
define its precise limits : nevertheless, I agree with those
who hesitate to apply the term to very many of the turbid,
particled fluids which at times are met with among the pro-
ducts of inflammation of the pleura and other serous mem-
branes.   Although, in their turbidity, their particled form,
and, above all, their inorganizable properties, they bear a
very close relation to pus, yet the far greater variety which
they present, in the size of their particles, their disposition
to separation on rest, dependent on the thin and serous
or watery character of the fluid part, and their want of that

nuciform and cream-like consistence so conspicuous in
true pus, form, in my opinion, a distinction too marked to
be broken through.

I do not, however, deny the possibility of unabraded
serous surfaces producing pus; but I think it comparatively
a rare occurrence, more especially in the pleura. Pus,
as you may have observed, does not acquire its characteristic
properties until it has lain on the secreting surface for some
time after its effusion. Sir Everard Home, who adopted
the erroneous idea that the particles of pus are identical with
those of the blood, admitted that, on its first effusion upon
an abraded surface, pus is a transparent fluid, and that it
subsequently becomes turbid or opaque. It can scarcely be
supposed that this change is effected solely by the material
being kept at a certain temperature. It seems much more
probable, that it is a vital process, in which the most impor-
tant influence is exerted by the living solid parts with which
the pus, in process of formation, remains in contact. In
speaking of this change as a vital process, I wish to be un-
derstood as not using the term 'vital' as a mystification, in-
volving obscure ideas of the nature of life, but merely to
indicate a species of change quite cognizable to our senses,
and of the nature of that which takes place in other secre-
tions; such as, milk and mucus, which are evidently altered
by remaining in the gland, or on the surface which produced
them. The formation of false membranes likewise tends to
shew that secretions continue to receive a modifying influ-
ence, after they are effused, from the surrounding solid
parts. If, in addition to these facts, we take into consi-
deration the expression, 'well-concocted pus,' employed by
the older pathologists—which seems to imply their having
observed that, in addition to secretion, a superadded process
was necessary—I think we may readily conceive why the
copious and rapidly-formed effusions met with in the pleura
cannot commonly possess the characters of true pus; that
since the extent of surface is so small, in proportion to the

amount of the secretion, the greater part of the fluid can
scarcely come under its influence.   The same considerations
will account for the occurrence of more completely-formed
pus in a greater number of cases of inflammation of the
peritoneum, which presents a large and irregular surface,
than of pleuritis; and for the decidedly purulent charac-
ters of small circumscribed collections of effusion occasionally
met with between the convolutions of the intestines and the
parietes of the abdomen.   It is perfectly in accordance with
this observation, that in partial plenrisies—as, for example,
those which are confined to interlobular fissures—the small
quantity of the product of inflammation, if not highly
plastic, is liable to pass into the form of genuine pus : such
collections being brought much more intimately into rela-
tion with the living and secerning surface, than is the case
with the more copious collections of fluid which are formed
in cases of extensive general pleurisy.

Laennec generally calls the turbid or opaque fluids col-
lected in the pleuræ, in cases of pleuritis, ' sero-puru-
lent'; and this expression, indicative of their mixed cha-
racter, is the most appropriate and the least exceptionable
which we can adopt.

When, in a case of empyema, this sero-purulent effusion
is very copious, the side of the chest which it occupies is
dilated, and the intercostal spaces are protruded.   Hey says
Symptoms that the intercostal spaces, when thus distended, yield on
of em-
pyema. pressure, but again protrude when the pressure is removed.
A dull sound is afforded by percussion.   Respiration cannot
be heard, or at most only in the immediate neighbourhood
of the spine, or at points where previous adhesion may
have attached the lung to the pleura costalis.   The ribs of
the affected side have little or no motion, the lung is com-
pressed into a very small compass, and, unless restrained by
previous old partial adhesions, is closely applied to the spine.
This state is rendered, in most cases, permanent and irre-
mediable, not only by the altered condition of the substance

of the lung, but also by the adventitious membrane which
invests it. It must have been from the inspection of pa-
tients who have died under circumstances such as I have
just described, that Panarolius and other ancient mor-
bid anatomists were induced to conceive that the lung
was sometimes quite destroyed. There is a fulness of
the hypochondrium from pressure upon the diaphragm;
and it has been generally supposed that, when one side
of the chest is filled by fluid, as in empyema, the me-
diastinum is pressed upon, so as to interfere in some de-
gree with the functions of the sound lung, and to occa-
sion the increased dyspnœa which is felt by most of those
who are labouring under empyema when they attempt to lie
on the sound side. Richerand denies, or at least doubts,
the truth of this pressure, and consequent displacement of
the mediastinum—not having been able to detect any thing
of the kind in the dead subject; when, for the purpose of
experiment, he had opened both sides of the thorax, without
interfering with the sternum or mediastinum, and, having
placed the subject on one side, had filled the other with water.
I cannot admit that this ingenious experiment completely
represents the state of the chest in empyema. Because the
mediastinum, after death, is not materially displaced by the
pressure of a few pints of water, we are not warranted in in-
ferring that no such displacement can occur during life, when
the tissues have the power of accommodating themselves to
circumstances; and when the pressure is long continued, and
is not merely dependent on the weight of the fluid, but also
on its continued effusion, which gives it a force sufficient to
protrude the intercostal muscles, and sensibly to dilate the
affected side of the chest. We have, moreover, very satis-
factory evidence that this displacement is at times effected,
in the well-authenticated, but by no means frequent fact, of
the heart's being pushed over to the right side by copious
effusion into the left pleura. One instance of this kind is
mentioned by Samuel Cooper, who himself saw the case in

Possibility of pressure on the mediastinum pro-ducing displacement.

Bartholomew's Hospital.   Others are narrated by Baron
Larrey, Pelletan, Boyer, and Lobstein : and an example
occurred to the late Dr. Baillie, in which the unusual si-
tuation of the heart's beat induced that distinguished master
of diagnostic tact to suspect for some time that there was a
natural transposition of the viscera. I have been told, that the
evident mortification which he felt, when the true cause of
this anomaly was afterwards explained, afforded a striking
proof of his general accuracy.   Several other instances of
the phænomenon questioned by Richerand, have come to
my own knowledge.

Empyema
on the left
side.

It has been stated, that empyema is very rarely met with
on the left side ; and I believe that it is certainly less fre-
quent than on the right.   Though I have known of several
instances, I cannot state in what proportion they have
occurred.

Contraction
of the tho-
rax conse-
quent on
empyema.

If the patient bear up against the constitutional irritation
attendant on empyema, the fluid is sometimes gradually
absorbed, and the affected side of the chest, from being pre-
ternaturally distended, becomes remarkably contracted.
This change is not simply the result of the parietes pas-
sively following the absorbed fluid, but is, I believe, in a
greater degree attributable to the contraction of the new
structure.   It is very easy to recognise the cases in which
this process has taken place.   The dulness of sound, on
percussion, continues more or less complete.   There is a

Symptoms
of the con-
traction.

peculiarity in the attitude and gait of the individual.   He
has the appearance of inclining to the affected side, even
when endeavouring to stand upright.   The chest is mani-
festly smaller, and narrower, on the affected, than on the
sound side.   Although, on measurement, the difference be-
tween the two sides is found to be less than the appearance
would have led us to suspect, yet we may often detect up-
wards of an inch of difference between them.   The inter-
costal spaces are contracted—the shoulder is lower than on
the sound side—the scapula is not closely applied to the

chest—the muscles, but more particularly the pectoralis
major, lose their volume. The spine, in the mean time,
generally continues nearly or quite in its natural position;
yet it may at length acquire a slight distortion, from the
habit, which the patient falls into, of inclining to the affected
side. The same habit gives a sort of limp to the gait.
This result of pleurisy, accompanied by copious effusion
which has not been promptly absorbed, is of pretty frequent
occurrence; and it is certainly very surprising that it
should so long have remained unnoticed. Laennec, who
was the first to describe it, has related several interesting
cases, illustrative of the fact. In some of these, the lung on
the affected side gradually resumed a part of its functions;
the sound of respiration was audible with the cylinder; and,
though the deformity of the chest was striking, the state of
the individual permitted active exercise, and the long and
public exertion of the voice.

The cure of chronic pleuritis by the contraction of the
chest, the most favourable termination of which it is suscep-
tible, will sometimes take place, in spite of the presence of
a considerable quantity of inorganizable matter. This, after
the fluid part is absorbed, is shut up in a cyst or envelope
formed by the organizable part; and may so remain, without
becoming a serious source of inconvenience. In such cases,
it sometimes acquires a bony or earthy character. At other
times, the absorption of the fluid, and the contraction of the
chest, may have proceeded for a considerable time, when a
new irritation, favoured by the presence of much inorgani-
zable matter, may give rise to fresh effusion; and under
this second attack, I have seen portions of the adventi-
tious formation lining the cavity detached and mingled
with the puriform effusion. In many cases, the fluid is not
wholly removed by absorption, but a portion escapes by an
external opening. A young man of my acquaintance, who
had been greatly reduced by a long-continued discharge
from an external opening in the pleura, so far recovered, as

to enjoy tolerable health, although one side of his chest became perfectly useless, and was scarcely three inches in depth from before to behind.

Process of nature in the ' em- pyema of necessity.' The evacuation of the fluid collected in empyema by means of a spontaneous external opening is not only an ex- tremely interesting fact in morbid anatomy, as affording an excellent specimen of a natural operation for the relief of the system, but it also deserves careful consideration, with a view to obtaining some useful hints as to the recommendation and performance of the surgical operation for the removal of the effusion. These cases of ' empyema of necessity,' as they have been called, are not of very rare occurrence; especially if we include among them the cases in which, an evident pointing having taken place, the perforation of the integu- ments has been assisted by art. Several examples of this kind are noticed in Dr. Young's laborious work on Con- sumptive Diseases. Andral has related three cases ; and at least as many have come under my own knowledge. I be- lieve that the greater number of them terminated favour- ably. At any rate, I think there can be no doubt that a greater proportion of patients have recovered after the spontaneous evacuation of the fluid than after the simple operation of paracentesis. It is very desirable and interest- ing to know the steps through which the natural process is conducted. The fact, that, for a considerable time, the structure of the serous membranes remains, to all appearance, almost healthy beneath the product of their inflammation, adds to the difficulty of the subject. It appears that some- times an abscess is formed externally to the intercostal muscles, and becomes, by a double opening, the medium of communication between the cavity of the pleura and the surface ; and Laennec mentions the partial gangrene of the lung and pleura as occasionally leading to ' empyema of ne- cessity ' ; but the process has not been particularly investi- gated by any author, and I have not myself had the oppor- tunity of watching throughout any of the cases which I

have seen during life, or of examining them after death. I
suspect, however, that, in some cases, the process resembles
one which more frequently occurs in the peritoneum ; viz.
that when a considerable quantity of the inorganizable pro-
duct of inflammation is collected, ulcerative absorption takes
place in that part of the serous membrane with which it is in
contact, and that, by a continuation of the same process, the
external opening is effected.

The operation of tapping the chest is one of very great Paracente-
sis thoracis.
antiquity and importance. When properly performed at the
right time, I have no doubt that it often affords the best, if
not the only chance of the patient's recovery; but it must
frequently depend upon a very nice point, whether it is to
prolong life, or to accelerate death. The fact, that in a large
proportion of cases, if not in the majority of them, the result
is fatal, has, in all probability, been the chief cause of this
operation being often either wholly neglected or too long
delayed. As there are some points in the anatomy of
empyema which are intimately connected with this opera-
tion, I shall not consider myself as stepping out of my pro-
vince in going into the consideration of the subject.

When a pleura, in which no previous adhesions have been State of the
lung and
pleura in
empyema.
produced, becomes affected with inflammation of a form
leading to the copious effusion of sero-purulent fluid, or, in
other words, to empyema, the lung is closely compressed
against the spine, and the surface of the pleura pulmonalis
is covered by an adventitious coating, which is generally
soft, loose, and little organizable, but differs considerably
in its thickness in different cases. Not only have the op-
posed surfaces of membrane very little if any disposition to
adhere, but they are separated by the abundant effusion,
which is often not merely turbid, but thickened by a multi-
tude of opaque particles dispersed through the serum, very
irregular in size and figure, and evidently similar in con-
sistence to the flocculent surface of the coating before men-
tioned, from which they were probably detached. In what-

ever part we may puncture a chest in this condition, except
in the immediate neighbourhood of the spine, and conse-
quently in the situation of the compressed lung, we can
scarcely fail to penetrate the cavity containing the fluid,
and to evacuate a part of it, if the patient be placed in a
proper position.   Asclepiades used to perforate a rib ; but

Place of
election in
paracen-
tesis.

this seems to be worse than needless trouble.   The inter-
costal spaces are generally, and very properly, preferred; but
even these afford considerable room for choice.   The lower,
anterior, and somewhat lateral part of the chest has been
generally selected.   Though this is the most depending
part, when the patient is standing, or sitting with an inclina-
tion forward, it is by no means the case when he is in the
recumbent posture.   Laennec has recommended that the
opening should be made about the middle of the side, be-
tween the fifth and sixth ribs, just anteriorly to the inser-
tion of the serratus magnus.   Where there are no pleuritic
adhesions, or other complications, it is probably not of much
importance whether the place recommended by Laennec, or
that commonly chosen, be selected ; but frequently these
complications do exist, and the proper choice of the spot
for the opening is then a matter of great moment and diffi-
culty.   When a previous inflammation of the pleura has
effected strong and permanent but partial adhesions between
the pleura pulmonalis and costalis, it is obvious that this
circumstance must affect the position into which the lung
will be compressed by the sero-purulent effusion, since the
part at which the adhesions exist will remain in contact
with the side.   If the puncture were unfortunately made at
this spot, not only the effusion would not be evacuated, but
the lung would be injured, and very probably be prevented
from ever recovering that degree of respiratory power which
might otherwise have been restored to it.   There is no
situation in which such adhesions more frequently occur, in
complicated empyema, than at the summit of the lung,
where they are often induced by tubercles.   In this situation,

few persons would attempt to perform the operation, unless
a decided pointing were to indicate that nature was herself
preparing an opening at this spot; in which case it would be
the most eligible, and experience has shewn that the result
may be favourable. Another situation in which the adhesions
of which we are speaking are likely to occur, is about the
lower lobes, and consequently at the very spot which is ge-
nerally selected for the operation.   Their frequency at this
part of the chest is, I believe, to be attributed to the lower
lobes of the lungs being the parts by far the most prone to
pneumonic inflammation; and we, comparatively, seldom find
this affection unaccompanied by inflammation of the corre-
sponding part of the pleura.   Since in this complication we
have not merely the pleuritic adhesions, but often a more
or less complete dulness of sound on percussion, in conse-
quence of the morbid state of the lung, it must necessarily
be difficult, or even impossible, to distinguish such a case
from one in which the dulness of sound depends upon the
pleuritic effusion.   This, though a strong reason, is not the
only one for preferring the spot recommended by Laennec.
Another, of at least equal force, is to be found in the fact,
that the diaphragm is sometimes carried up into the thorax,
far above its origins, and is united, by adhesions on its upper
surface, to the pleura costalis.   The space which the abdo-
men thus gains on the thorax is occupied by the liver, if,
as is generally the case, it be on the right side that the
encroachment has taken place: indeed, the enlargement
of the liver is often the sole or the principal cause of the
elevation of the diaphragm. We have, then, both the dull
sound and the fulness of the hypochondrium which may
be mistaken for the effects of effusion.   It is sufficiently
obvious, that if the operation for empyema were to be per-
formed at the spot usually recommended, on a chest in
which this elevation of the diaphragm had taken place, the
abdomen, instead of the thorax, would be penetrated.   This
is not a merely supposed danger.   Laennec, in the first

Reasons for preferring the spot chosen by Laennec.

edition of his work on Mediate Auscultation, has given the
details of a case in which the occurrence alluded to ac-
tually took place. Whatever may be said by those who
attempt to depreciate the stethoscope as an aid to diagnosis,
and who insinuate that it is a useless refinement to discover
the particular part of the lung which is diseased, or the pre-
cise form and extent of its derangement—that the treatment
and termination of phthisis will be just the same, whether
pectoriloquism be heard above the clavicle or in the axilla ;
there can be no doubt, that when, as in the case of empy-
ema, a surgical operation is to be performed upon the
chest, the most invaluable assistance may be derived from
it.   It makes all the difference, between the hesitation
or rashness of ignorance and uncertainty, and the cool
confidence which knowledge alone can inspire.   The
late Dr. Gregory of Edinburgh, in a very remarkable and
interesting publication, entitled a Memorial to the Ma-
nagers of the Royal Infirmary, has given a curious and
amusing illustration of the doubt and difficulty which at-
tended the treatment of these cases, before medical men
were acquainted with the methods of investigation introdu-
ced by Avenbrugger and Laennec.   With much ceremony,
a multitude of surgeons were collected in the consulting-
room, with the poor patient before them.   A long discus-
sion resulted in nothing being attempted.   On the other
hand, I may mention, that Laennec, having occasion
to meet a surgeon who was to perform paracentesis for
empyema, saw the trochar plunged into the chest, but
no fluid follow.   Confident, from his own examination, as
to the situation of the fluid, he took the instrument himself,
though unaccustomed to operate, and immediately gave
exit to the effusion.   I have heard Laennec relate the fact.

Although the opening may have been made in the best
possible situation, and great temporary relief afforded to the
patient, we must never be very sanguine respecting the
ultimate result.   The unhealthy and feebly organizable cha-

Value of auscultation in empyema.

Prognosis in paracen- tesis.

racter of the false membrane which we know to line the cavity from which the fluid has been removed—the impossibility of the lung's promptly expanding, to fill the place evacuated by the sero-purulent effusion—the unavoidable admission of air to the vacant space—and the decomposition of the fluid still existing in the cavity, favoured by the contact of the admitted air—all contribute to oppose the recovery of the patient. Yet, as his recovery will at times take place, notwithstanding all these impediments, we ought not to be deterred from having recourse to an operation which may lead to a cure, or, if it fail in obtaining this desirable end, may prolong life and diminish suffering; whilst, at times, it affords the only means of warding off immediate suffocation.

The choice of the mode in which the opening is to be made, is a subject well worthy of consideration. When the operation is ordered for the purpose of averting death by suffocation imminently threatening, there can be little doubt but that incision with the knife, or puncture with the trochar, will be the readiest and best method. It will of course be accompanied by the usually-recommended precautions, of making the opening in such a manner, that it may be spontaneously closed on the removal of the canula, and of evacuating only a moderate portion of the effusion at one time. When the operation is not ordered on so pressing an emergency, it may be allowable to doubt, before giving the preference to the trochar. I confess, that in a case such as I am now supposing, I should be strongly inclined to give the preference to an opening effected, at least in part, by cautery. I should do so, in the first place, because the operation thus performed would be a more faithful imitation of the natural operation, which, as I have before stated, leads to a larger proportion of successful results than the purely artificial mode: and secondly, because a strong external irritation, such as that produced by a cautery, is one of the most powerful means of promoting

Mode of operation— by knife or cautery?

the removal of the fluid by absorption. Those who will
take the trouble to refer to the older authors, will find
numerous cases of supposed consumption, which evidently
were cases of pleuritic effusion, cured by cautery applied to
the chest. Several cases of this description are noticed in
Dr. Young's work on consumptive diseases. Whilst, then,
we are preparing a way of escape for the effusion, we are, at
the same time, giving to nature the best chance of removing
it herself; and we may, perhaps, fortunately find, that before
an opening is effected, she has so well performed her part,
that the plan may be changed, and, instead of completing the
perforation of the chest, we may co-operate with nature by
the application of one or more additional cauteries. When
this desirable result does not follow the use of the cautery,
and we are left to pursue our plan of opening the chest
principally by this means, I believe that the cavity will be
in some degree prepared for the opening; whereas it is
taken by surprise by the trochar. You will think that the
idea which I have just advanced is somewhat fanciful; but it
is a fancy founded on the observation of the operations of
nature. I am aware that the advocates for the use of the
trochar may adduce, in support of their side of the ques-
tion, the story of an individual, who, feeling that he was
labouring under what he conceived to be a fatal affection of
the chest, entered the army, with the hope of dying in battle,
rather than by a lingering disease; but who, instead of fall-
ing in an engagement in which he was much exposed, had
the singular fortune to receive a wound in the chest, by
which the fluid was evacuated, and his health restored.
Thus he found his life, where, and in the very means by
which, he hoped to lose it.

Experi-
mental
opening of
the pleura.

Dr. Davies's
instrument.

It may sometimes be desirable to test the presence of
fluid in the pleura by an experimental opening. To facili-
tate this operation, a simple instrument has been contrived
by my friend Dr. T. Davies, by which the operation is ren-
dered almost as trifling as mere acu-puncture. The instru-

ment consists in a needle-pointed stilet, which, gradually
increasing in size, becomes, in its thickest part, as large as a
crow-quill. A groove is made on one side, something like
that of a director, which, when the instrument is introduced,
allows the escape of the fluid from the cavity. Although
it is extremely probable, were the operation of tapping the
chest more frequently performed at an early stage of pleu-
rritic effusion, that the proportion of successful cases might
be greatly increased, yet I am not inclined to encourage
the frequent resort to this mode of treatment; since it is
certain, that very large collections of fluid may be removed
by the natural process of absorption. Where the product
of inflammation has been of the most plastic kind, this re-
sult does perhaps invariably occur; and even where the
serous effusion had been of a sero-purulent character, the
total removal of the fluid part, and the shutting up of the
concrete residuum, leaves the chest so free from active
disease, that it is very doubtful if a better result could have
been obtained by tapping.

The fluid collected in the bag of the pleura, in empyema, Opening of
sometimes finds an exit by a communication formed between empyema into the
the cavity in which it is contained and the bronchial tubes. bronchi.
In these cases, there generally takes place a sudden and co-
pious puriform expectoration, often of the most offensive
description. If not immediately fatal by the mechanical pro-
duction of suffocation, this occurrence generally alleviates the
sufferings of the patient. The relief, however, is only tem-
porary;—the fluid in the pleura is very partially evacuated;
—the quantity discharged is soon replaced;—the sufferings
of the patient recur, to be again relieved by a fresh expec-
toration. These discharges, with their attendant circum-
stances, are usually repeated, at longer or shorter intervals,
until the patient is cut off, either worn out or suffocated;
but, in some rare and fortunate cases, the expectoration gra-
dually diminishes, and health and strength return. Examples
of communication formed between puriform effusions in the

pleura and the bronchi are related by Laennec and Andral,
and probably by many other authors. I saw one, if not
more cases of this description, in the Clinical Ward in Edin-
burgh ; and my friend Dr. Foville of Rouen has communi-
cated to me some of the details of an interesting case of
this kind which occurred in his practice. A man, about
forty-two years of age, above the middle stature, with rather
a predominant developement of the chest and upper extre-
mities, possessed of strong respiratory organs, giving him
the power of long-continued and rapid running without
becoming out of breath, and habitually enjoying excellent
health, was attacked, in March 1826, with a trying pain in
the left shoulder. It was regarded as rheumatic by the
medical man who then saw him, and soon gave way to
the use of baths. A difficulty of respiration, however, re-.
mained. A dry cough recurred every morning and even-
ing, unaccompanied by pain, but there was a general and
fatiguing lassitude and uneasiness. These symptoms conti-
nued to increase; the cough, in particular, became more fre-
quent and troublesome. One day, after a very obstinate fit
of coughing, there took place a sudden and abundant expec-
toration of thick, yellow, and very offensive matter. This
was followed by some relief to the patient, and no similar
expectoration took place for several days ; after which, it
again occurred, preceded by another obstinate fit of cough-
ing, and succeeded by fresh alleviation. A few more days
elapsed, and were followed by a repetition of the same
occurrences : in fact, similar fits of coughing and expectora-
tion continued to recur, at intervals of seven or eight days,
for about a month. It was at this time, two months from the
commencement of the attack, that Dr. Foville first saw him.
The patient then reclined on his right side—the respiration
was very difficult, especially when the slightest movement
was attempted—the lips were of a deep red, and the eye-lids
somewhat livid or blue—the pulse was feeble and rapid,
with an intermission between every third or fourth beat

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Case of
empyema
opening
into the
bronchi.

</div>

(this irregularity, however, was ascertained to have existed ten or twelve years)—the hands were cool and clammy, but the left was sensibly cooler than the right—the left side of the face was likewise paler and cooler than the right—the left side of the chest afforded a dull sound on percussion, and no respiration could be heard with the stethoscope, except at the upper part, and there very equivocally. The ribs on this side partook of the movements of respiration less than on the right side, which was generally resonant on percussion, and the sound of natural respiration was audible by the stethoscope. The abdomen was distended. The patient experienced neither appetite nor thirst; and the little drink which he took seemed to remain several hours, or even days, in the stomach. The bowels were constipated, and the urine very scanty and loaded. These symptoms were accompanied by little or no emaciation, notwithstanding the almost total abstinence of the patient. A seton was inserted in the side, but it was long before it produced any discharge, and then only to a very slight degree. It procured no relief; in fact, the respiration became increasingly difficult, but there was no paroxysm of cough or return of expectoration for the space of a month. He was then attacked with a fit of coughing, accompanied by a sudden, abundant, and fetid discharge. A few days afterwards, there was a recurrence of similar circumstances, when Dr. Foville happened to be present. The patient could scarcely breathe. Each effort at inspiration was alternated with a cough for exspiration, and the discharge of horribly fetid puriform matter. The paroxysm lasted three-quarters of an hour; when the patient's wife, who was supporting his head and holding the bason, could no longer bear the stench, and was compelled to leave the room. The patient observed this; and, uttering an expression of pity towards her, fell into a syncope, and died in the Doctor's arms. The body was opened the following day. As soon as the bistory had penetrated the chest, it gave vent to a jet of pus or

sero-purulent matter, eight inches in height. Three large
basons were filled with this matter. The lung, compressed,
but not otherwise altered in its structure, was carried to the
upper part of the cavity. At its lower part, there was an
opening, communicating with the bronchial tubes. The sides
of the cavity were lined by pseudo-membranous flakes, a
number of which had been detached, and were floating in
the fluid. Some of these plugged up the opening commu-
nicating with the bronchial tubes. The heart was remark-
ably small: a cartilaginous growth contracted the opening
of the aorta. The body had not sensibly wasted since the
commencement of the illness.

The almost total suspension of absorption, as evinced by
the absence of emaciation, and the loss of appetite both for
fluid and solid food, in conjunction with copious effusion
into the pleura, seems to be analogous to some of the expe-
riments of Magendie, in which absorption appeared to be
suspended by the artificial repletion of vessels or visceral
cavities.

The communication between pleuritic effusions, and the
air-passages of which I am speaking, produces the most
frequent form of pneumothorax. It is in these cases
that we sometimes find that decided evidence of the pre-
sence of fluid, which is afforded by distinct fluctuation, and
even by a splash, when the chest of the patient is shaken.
Metallic
tinkling—
under what
circum-
stances
heard. We have likewise, in these cases of pneumothorax, accom-
panied by effusion, that remarkable and peculiar stethoscopic
symptom, called 'metallic tinnitus,' in which the voice and the
cough of the patient sound as if they were produced within
a brazen vessel. Pneumothorax is, however, sometimes
produced by the exhalation of gas from the decomposing
sero-purulent effusion, without there existing any commu-
nication with the air-tubes; but in this case, though we may
have the distant fluctuation and splash, there is no metallic
tinnitus. For the production of this symptom, it is essen-
tial that there should be not only a large cavity containing

both air and a liquid, but there must likewise be a communication between this cavity and the air-tube. Hence we have the metallic tinnitus, both in the form of pneumothorax, of which I first spoke, and also in those cases of phthisis in which a very large portion of the lung is excavated.

The stethoscope affords the most valuable assistance in the diagnosis of cases of pneumothorax. Since the method of percussion recommended by Avenbrugger will, if the quantity of air in the chest is considerable, procure as great a degree of resonance as from a healthy chest, it is obvious that this method of examination, employed singly, will expose us to considerable chance of error. If the dilatation of the chest have not been considerable, or if subsequent contraction have removed it, the measurement of the chest will not throw any light on the case. The mode in which the patient reclines may likewise be fallacious. The early stage of the affection may, and often has been, either mistaken or overlooked; or, should this not have happened, the practitioner to whom the patient presents himself, when the malady has assumed the precise form of which I am speaking, may not be made acquainted with the exact history of the case. Again; if, from any accidental combination of circumstances, the side of the chest, on which the pneumothorax does not exist, happen to afford a dull sound on percussion, from being œdematous, or from old pleuritis, or any similar cause, the more healthy side of the chest may, without the aid of the stethoscope, be mistaken for the diseased one. A fatal instance of this kind occurred, some years since, in the neighbourhood of Edinburgh. A gentleman was supposed to be labouring under hydrothorax, or empyema, and it was determined to perform the operation of tapping for his relief. The patient, who at the time was not confined to bed, rode out to see some of his neighbours, from whom he was expecting to be detained some days by the confinement following the tapping. His

[margin note:] Utility of the stethoscope in pneumothorax; and fallacy of percussion alone.

visit proved a last farewell; for the affected side having
been mistaken, from one of the causes I have mentioned, the
trochar had no sooner penetrated the sound side of the
chest, than the air rushed in, and, depriving him of his only
means for carrying on the function of respiration, extin-
guished life immediately.   Had the stethoscope been em-
ployed, the resonance of the chest could not have been
attributed to the healthy state of the lung; because the
sound of respiration would necessarily have been wanting,
and the dulness of sound on the healthy side could not
have been attributed to the presence of fluid, because respi-
ration would have been heard, and would, in all probability,
have been even puerile.

It sometimes happens, that the communication between
the bronchial tubes and the pleuritic effusion co-exists with
external openings.   In these cases, when injections have
been employed for the purpose of promoting the closure of
the fistulous external opening, their taste has been perceived
in the mouth.   Several instances of this kind are cited by
Dr. Young.

Before quitting the subject of pneumothorax, I may just
mention a third form, neither dependent on a communication
between the bronchi and the pleura, nor on the decompo-
sition of the effusion.   It is supposed to arise from the se-
cretion of air by the pleura itself.   Such an occurrence is
undoubtedly rare; but the cadaveric production of gas,
which in some states of the body takes place very shortly
after death, may easily be mistaken for it.

Worm-
eaten ap-
pearance of
pleura.
There is an appearance which deserves particular atten-
tion, and is sometimes met with on the pleura and other
serous membranes, when inflammation has been of a chronic
character, and its product of that mixed description, which,
though it never assumes the form of cellular membrane,
nevertheless becomes a permanent tissue, having a close,
compact, and almost semi-cartilaginous character, resembling
what Laennec has described as white non-fibrous tissue.

The peculiar appearance to which I allude, consists in
the surface of this dense adventitious structure being ren-
dered uneven by irregular yet rounded depressions, some-
times distinct, sometimes running into each other like
confluent small-pox, and presenting an appearance which
suggests the idea of the part affected having been worm-
eaten. I had been at a loss to explain how this appearance
was produced, when my friend Thomas W. King, in one of
the inspections which he performed for me, discovered a
pleura in a state which threw important light upon the sub-
ject, and cleared up the difficulty. In this case, the pleura, *Mode of its
thickened by dense semi-cartilaginous deposit, presented production.*
the worm-eaten appearance which I have mentioned; but
the depressions, instead of being vacant, were filled with a
soft, yet concrete inorganizable material, which was not
however involved in, or adherent to, the more plastic form
of the product of inflammation, as in some cases in which we
have seen tuberculous or inorganizable matter shut up in
the false membrane: on the contrary, this inorganizable
matter was easily removed, leaving a clean and defined mar-
gin and surface to the depressions which it had occupied.
Hence it would appear, that the worm-eaten appearance of
the thickened surface is not produced by ulceration or other
destruction of the thickening deposit, but that its deposition
or formation had been prevented by the presence of a dif-
ferent material. This process bears some resemblance to
that employed by aquatintors, to limit the adhesion of the
varnish which they apply to those parts of their plates which
they wish to protect from acid, and to leave as lights in the
picture.

In the cases which we have been hitherto considering,
the inflammation extends itself over the whole, or far greater
part, of the surface of the pleura; those parts almost alone
escaping, which have been more or less closely united by
old previous inflammation. I must not wholly pass over *Partial
those pleurisies which are more partial. I believe that they pleurisies.*

are rarely primary; but owe their origin to some local cause,
which may either be, accidental external violence, as the
fracture of a rib, or some pre-existing disease. This pre-
existing disease may either have its seat behind the pleura
pulmonalis, as in inflammation of the substance of the
lung and the developement of tubercles, or behind the re-
flected pleura; as when an abscess of the liver makes its way
into the chest, and, by the aid of the partial pleuritic adhesion
at the base of the lung, finds a communication with the
bronchial tubes, without invading the cavity of the pleura.
Laennec remarks, that these partial pleurisies—which may
be called 'dry pleurisies,' in contradistinction to those which
are accompanied by abundant sero-purulent effusion—are
generally trivial complications of affections of much more
importance; and that, often, neither the medical attendant,
nor the patient, perceives any well-marked symptom de-
pendent on them.

I have already mentioned the term 'dry pleurisies'; and
remarked, that too much had been made of them; stating
that a pleurisy without fluid effusion is extremely rare.
Laennec says, that, within a few years, much needless impor-
tance has been attributed to dry pleurisies, in different new
works, periodical publications, and theses published by the
pupils of the School of Paris. He very much doubts the
existence of pleurisies in which there is a simple secretion
of a false membrane unaccompanied by the simultaneous
exhalation of a serous liquid. He thinks that most of these
supposed cases may be reduced to two forms:—the first,
in which the serosity has been completely absorbed before
death; and the second, in which the consolidation of the
pulmonary structure has afforded an obstacle to the produc-
tion of the effusion. He considers that the obstacle is
mechanical. As to the first form, after adverting to the
rapidity with which absorption takes place under certain
circumstances, Laennec informs us, on the authority of
Dr. Guersent, the physician to a large hospital for children,

that the examples of coagulable effusion in the form of a
false membrane, unaccompanied by a notable quantity of
fluid effusion, are much more frequently met with in the
pleura of young subjects than in those of adults. Laennec
ascribes this fact to the greater facility with which absorp-
tion takes place in childhood. In the second form, or
that in which the inflammation of the pleura takes place   *with pleuri-*
in conjunction with induration of the lung from inflam-   *tis accom-*
mation, there is probably, as Laennec believed, not only   *panied by*
a small and scanty effusion of fluid, but also an increased *indurated*
absorption favoured by compression. Whatever be the   *lung.*
explanation we may choose to adopt, there can be no
doubt respecting the fact, that, in this complication, the
pleurisy is often partial, corresponding to the hepatized
portion of the lung; and that the proportion which the
fluid bears to the concrete part of the effusion is often very
small. The author whose opinion I have been giving,
regards this complication as tending to diminish the inten-
sity of the inflammation in both structures. He considers
the partial pleurisy accompanying phthisis, when a portion
of the lung is indurated by the presence of tubercles, as
apparently unaccompanied by fluid effusion, from the same
cause which operates in pleuro-pneumonia. Nevertheless,
in some of those cases in which traces of pleuritic inflam-
mation accompanying tubercles are limited, he thinks that
the affection has been chronic, and the exudation of coagu-
lable matter unaccompanied by any fluid effusion.

Some cases of partial pleurisies are more closely allied to   *Pleuritis*
those which are general; since, instead of depending on any   *limited by*
peculiarity in their exciting cause, they are limited by old   *old adhe-*
adhesions, which, uniting the greater part of the pleural   *sions.*
surfaces, leave but a small portion exposed to a recurrence
of inflammatory effusion. When I before alluded to these
adhesions, in connection with recent pleurisy, I only spoke
of those cases in which the adhesion had united a compara-
tively small part of the surface of the pleura. In the cases

now contemplated, the serous surface remaining unattached
bears but a small proportion to the extent of surface from
which the effusion is excluded. When an attack of pleurisy
has had the effect of uniting the pleura pulmonalis to the
pleura costalis, it frequently happens that a well-organized
layer of adventitious cellular membrane connects the oppo-
site edges of the lobes of the lungs, and shuts up the inter-
lobular fissure, which, in such cases, does not appear in the
least to participate in the inflammation. But, though it thus
escapes at one time, it may be attacked by inflammation at a
subsequent period : hence the interlobular fissures afford
some of the most remarkable examples of the form of par-
tial pleurisy of which I am now speaking. Bayle, it is
believed, was the first morbid anatomist who particularly
pointed them out. The effusion which takes place in these
fissures is shut up, and, as it were, incysted, and can never
become very abundant. The cavity which it occupies, is
gained at the expense of the lung, which is compressed, so
as, in some cases, to appear excavated. The effusion, when
not of the plastic form, presents more completely the cha-
racters of pus than the generality of pleuritic effusions ;
and affords a good illustration of the remarks which I offered,
when speaking of pus, and of the products of inflammation
resembling it. These collections, resulting from the cir-
cumscribed inflammations of the interlobular fissures, might
readily be taken for abscesses in the substance of the lung ;
a mistake which has probably had some share in leading to
the commonly-received opinion, that pneumonia often ter-
minates in abscess—an event which is, in reality, of very
rare occurrence.

Partial inflammations are sometimes produced between
the base of the lungs and the diaphragm, precisely in the
same manner as they take place between the lobes of the
lungs ;—that is to say, the space which they occupy has
been shut up by previous old adhesions along the edge
of the lower lobes of the lungs. It would seem, however,

that it is not absolutely necessary that previous adhesions should, in these cases, exist, to arrest the extension of the inflammation. The circumstance of the abrupt change in the direction of the membrane seems itself to have considerable influence in producing this effect: at least, this appears to me to be the readiest explanation that I can offer, of the occasional occurrence of cases in which inflammation has been set up between the base of the lung and the diaphragm, without extending itself to the sides of the chest, although there were no previous adhesions to prescribe the limits. It is highly probable, that to this same cause we must attribute the frequent escape of the interlobular fissures, under those attacks of inflammation which affect almost every other part of the pleura. The limitation of the sanguineous effusion in some cases of apoplexy is perhaps analogous to these limitations of pleurisy.

The inflammation of the pleura between the base of the lungs and the diaphragm is generally accompanied by symptoms which are extremely severe and peculiar, and very often proves fatal. When this is not the case, the contraction of the adventitious layer, to which it gives rise, is sometimes so considerable, as to produce a strongly-marked fold in the diaphragm, with a corresponding depression on the convex surface of the liver.

The inferior, and posterior, or lateral parts of the chest are likewise mentioned as being the seat of partial pleuritis. Indeed, examples of this kind are described by Laennec amongst the most frequent cases of partial pleurisy; but I must confess, that it is not so easy to explain the cause of their limitation, unless they belong to those cases which I have already described as resulting from the inflammation of the substance of the lung.

Concretions are sometimes found loose in the cavity of the pleura. I believe that they are to be ranked amongst the effects of the inflammation of the pleura; since, in structure, they have been found to vary from that of a soft and

Detached bodies in the pleura.

K

tender coagulum, to that of cartilage, fibro-cartilage, or
even bone. Laennec says, that when the fluid effused in
pleurisy is considerable, there may be sometimes found in
it a concrete coagulum of a globular or ovoid figure, and
exhibiting no trace of having ever been attached to the
pleura; although he seems to think it impossible but that it
had at one time such an attachment. Elsewhere, however, he
speaks of detached portions of coagulable lymph, approach-
ing to the character of serous tissue, though they did not ap-
pear to have been ever attached to the pleura; and he draws
an analogy, which I am not prepared to admit, between them
and the phænomena which take place in the developement
of an egg. I have myself found in the cavity of a pleura,
which had evidently been affected with inflammation, a per-
fectly detached mass of coagulum, of the most plastic form,
of considerable firmness, and of a flattened ovoid figure: it
was nearly of the colour and size of an egg-plum, but not so
thick. Wardrop, in a paragraph which he has added to his
edition of Baillie's Morbid Anatomy, appears to allude to
concretions of the kind of which I am speaking; and is very
probably correct, when he compares them to concretions
which are occasionally found in the synovial membranes.
In the example which he gives, from his own observation,
the concretion was not absolutely loose in the cavity of the
pleura, but was attached by a few thin membranous bands:
it was composed of concentric layers of fibro-cartilaginous
structure, upon a nucleus of bone. I have likewise seen
one or more cartilaginous bodies which were all but de-
tached, being merely adherent to the pleura by a slender
and delicate film, which seemed much more like a secondary
formation, than the medium through which the cartilaginous
body had been formed and nourished. In another instance,
the cartilaginous body presented a corrugated and uneven
surface, somewhat like that of a mulberry calculus from the
urinary bladder. This, as I have already stated in my pre-
liminary Lecture on the serous membranes, may be attri-

unted to the contraction of the interior, after the surface had
become consolidated.

You will probably recollect, that, in my general observa-
tions upon the inflammation of the serous membranes,
I remarked, that the effusion of the most plastic form sepa-
rates into concrete and fluid parts, without the former being
necessarily adherent, or even applied, to the surface of the
serous membrane ; although the tender film which it forms,
is more or less moulded to the figure of the membrane. It is
however difficult to conceive the possibility of these produc-
tions passing into the state of a permanent tissue, until they
have established a connexion with the surrounding living
parts ; and I must confess my inability to explain the process
by which these loose masses of coagulum arrive at the ulti-
mate stage of cartilage or bone. At the same time, I think
that there are various reasons for believing that some im-
portant part of the function of nutrition is carried on, inde-
pendently of the vessels, by a process resembling endosmo-
sis and exosmosis. The substance of the loose bodies of
which I have just spoken is manifestly a very imperfect
tissue, and doubtless owes its persistence to the peculiarity
of its situation.

Although fluid effusions of an inflammatory character are
by no means infrequent in the cavities of the pleura, those
of an atonic description, except as they occur a very short
time before death, are much less frequent than is generally
imagined. I have often observed, that the symptoms which
are supposed to indicate hydrothorax were merely de-
pendent on a bronchial affection. In this observation I am
fully borne out by Laennec; who says, that water in the
chest, which is regarded by the public, and even by many
practitioners, as a very common disease and a frequent
cause of death, is really very rare. He does not think that
idiopathic hydrothorax, to an extent capable of causing death,
can be established in a larger proportion than one in two
thousand cases. But, he informs us, he has heard medical

*Atonic
hydrotho-
rax—rarely
met with.*

men who were not much acquainted with morbid anatomy, and who were consequently very weak in their diagnosis, style as hydrothorax, cases of hypertrophy of the heart, of aneurism of the aorta, or of phthisis, with some little irregularity in the symptoms, and even cases of cancer of the stomach, and of induration of the liver. I have repeatedly seen the same mistake with respect to bronchial affections; and inflammatory effusions into the pleura have also been mistaken for hydrothorax.

Idiopathic hydrothorax—commonly unilateral. When idiopathic hydrothorax does exist, it is generally confined to one side. The serous membrane preserves its healthy appearance, and merely contains an accumulation of clear serum. The lung is compressed, flaccid, and deprived of air; and when the effusion is very considerable, the affected side is sensibly dilated. Laennec has seen a hydropic collection in the chest sufficiently copious to produce this effect without the concurrence of anasarca, or of effusion into any other serous membrane; and without the existence of any organic derangement of the viscera, to which it could be attributed.

Symptomatic hydrothorax—almost confined to the moribund. Symptomatic hydrothorax is as common as the idiopathic form is rare. It is almost equally liable to accompany all diseases, whether acute or chronic, general or local; and its appearance is usually the token of a speedy and fatal termination. Sometimes it takes place a very short time, a few instants, before death: and it is rare for the symptoms which denote its existence, and which are similar to those of the idiopathic form, to present themselves more than a few days, or even hours, before death. It is extremely uncommon for the signs of hydrothorax, even in cases of organic diseases of the heart attended with ascites and general anasarca, to have made their appearance so long as a week before death. Symptomatic hydrothorax may, then, be regarded as an affection almost peculiar to those who are in the agonies of death. The fluid effused is often clear and colourless; but it is sometimes yellow, and at others sanguinolent.

When it exists on both sides, it tends to render the last moments painful, from suffocation. Yet we sometimes find a considerable effusion on both sides, when the dyspnœa preceding death had not been very remarkable. In these last-mentioned cases, Laennec thinks that the effusion took place almost at the moment of death, or within the first few moments after that event. He has seen upwards of a pint of serum in the pleura, when, a quarter of an hour before death, there had been no symptoms of its presence : and, on the other hand, he has repeatedly observed, that there was scarcely an ounce or two of serum in the chest, although distinct œgophony was heard a short time before. " In the one case," he asks, " have not the exhalants—and in the other, the absorbents—been in action during the agony, or immediately after it ?" These are questions which I am not able to decide ; but they shew the importance of being well acquainted with the appearance of the lungs and pleuræ after long exposure to effusion. The state of the lung affords, perhaps, the best means of distinguishing these recent cases of hydrothorax, from those which have been of longer standing. The pulmonary tissue is less compressed, still contains some portion of air, and wants the appearance of maceration ; which is very evident, when the effusion has been of long standing.

I have already mentioned, that the product of inflamma- Blood in the
tion of the pleura is at times mixed with blood. Blood may pleuræ.
be found in the pleura from other causes, and to a much greater extent : it may occur by a species of exudation in purpura hæmorrhagica, from a state of the system allied to scorbutus, when it is probably confounded with one form of pulmonary apoplexy. The bursting of aneurisms is per- haps the most frequent cause of the effusion of blood into the pleura : and it may likewise occur from wounds in the chest, in which the intercostal or mammary artery has been implicated. I have seen a copious effusion of blood behind the pleura costalis, which was extensively detached

in consequence of rupture of the aorta, independently of aneurism. The vessel, which was much diseased, had suffered a kind of splitting or lamellar separation of its parietes, which had probably allowed the somewhat gradual escape of blood; since the patient survived several hours from the time of seizure, which appeared to be spontaneous, and independent of external injury.

Attached surface of pleura— effects of inflammation. I shall now proceed to speak of the attached surface of the pleura. The effects of inflammation on this surface are sometimes found in the form of serous effusion, producing œdema: at other times, the effusion is of the plastic character, in which case its limits are generally defined: and not unfrequently, it is inorganizable, and assumes the form of a nearly concrete pus. The attached surface of the pleura pulmonalis is very rarely the seat of morbid appearances. There is, however, sometimes a partial deposit, producing a slight thickening of a nearly opaque white colour, in some instances accompanied with a little puckering. The polished surface of the pleura at these spots is often quite natural; yet the occasional occurrence of a slight adhesion to the opposite surface of pleura costalis must, I think, be allowed to indicate their inflammatory origin. The existence of tubercles in the substance of the lungs is probably the most frequent exciting cause of inflammation on the attached surface of the pleura pulmonalis: and I believe that the thickening of the pleura, which we often find at the summit of a tuberculous lung, has generally commenced in this form; although the adhesions which are so often found between this part and the parietes evince that the polished surfaces may also become affected.

On the attached surface of the pleura covering the parietes, inflammation leads to the œdematous, plastic, and puriform effusions which I have enumerated; and cartilaginous and even bony deposits are sometimes the ultimate Ossification behind the costal pleura. result of its action. When bone is formed behind the pleura costalis, it is generally in the form of thin plates; and

Dr. Baillie said that he had never seen it in any other. In a specimen which I took from an old man who died in this hospital, there was not merely a plate of bone nearly half encircling the chest, but also a considerable mass of the same substance. In another case, in which there was a very extensive plate of bone behind the pleura costalis, on the right side, this was the only circumstance met with to account for the liver, which was not remarkably large, having been felt very distinctly, and unusually low, in the right hypochondrium.

Circumscribed cysts, containing earthy matter, are sometimes found behind this portion of the pleura: they are probably the result of inflammation of limited extent, which had led to the formation of deposits of a purulent or inorganizable character. I have seen a cyst, which appeared to be of this nature, filled with small white earthy grains, resembling comfits.

Gangrene of the pleura is an extremely rare occurrence: it hardly ever takes place, except in conjunction with gangrene of the lung; and in these cases it is generally confined to a small space, nearly correspondent to the affected portion of lung. In a case which occurred in this hospital, the extent of gangrene was very considerable; and though accompanied by gangrene of the lung, it did not appear that this was the sole cause. The inflammation of the cellular membrane on the attached surface had probably contributed to the production of sphacelus.

Gangrene of the pleura.

The pleura covering that part of the diaphragm on the left side which is opposed to the cardiac extremity of the stomach is sometimes destroyed by a process which, if it be not strictly cadaveric, seems to be more allied to gangrene than to ulceration; and appears to be the effect of the chemical action of the secretion of the stomach, the coats of which are found perforated at this part.

The attached surfaces both of the pleura pulmonalis and costalis are liable to become the seat of accidental produc-

Scrofulous deposits beneath the pleura.

tions; such as, the scrofulous, the cancerous, the fungoid, &c. Though I believe that it is generally on this surface of the pleura that the productions of which I have now to speak are formed, I must state, that some able pathologists, amongst whom I cannot mention a higher authority than that of Laennec, consider that it is in the substance of the serous membrane itself, and also on the polished surface, as well as on the adherent surface, that the accidental tissues are sometimes developed. I shall not at present take up your time with the examination of this question. With respect to the scrofulous productions to which the term 'tubercle' is at times restricted, I am ready to grant that they may be formed in all these situations, and perhaps, even most frequently, in or under the false membrane attached to the surface of the pleura. I have seen small tubercles, regarded as scrofulous, producing numerous elevations of the pleura behind which they seemed to have been formed; but I am ignorant of the symptoms which attended them. In a case of pleurisy of rather a chronic character and attended with little if any pain, in a very much debilitated subject who had long been labouring under rheumatism, there was abundant fluid effusion; and the thin and nearly opaque false membrane which lined the cavity was very closely sprinkled with small opaque miliary tubercles, which appeared to be situated on the membrane itself. They were probably of a scrofulous character; since miliary tubercles were found in the compressed lung of the same side. Tubercles of this description, thickly set, have been mistaken for thickening of the pleura itself.

Malignant disease affecting pleura.

In speaking of deposits of tubercles of a cancerous or malignant character affecting the pleura, I shall not enter into the consideration of the distinctions which it has been attempted to draw between the accidental productions of this class; as the nature and structure of these formations will be made the subject of some of our earliest succeeding Lectures. In persons who have died with decidedly can-

cerous affections of the mamma or other parts of the body, it is by no means uncommon to find a few very small firm tubercles sprinkled immediately under the surface of the pleura pulmonalis; this membrane, and the lungs them-selves, seeming in other respects to be perfectly healthy. In such cases, these small tubercles are often found in greater numbers beneath the pleura covering the parietes. When the affection by which the constitution is contami-nated is of the character denominated 'fungoid,' the tuber-cles are frequently larger, and more prominent.

In a case in which the peritoneum was nearly covered with large tumors and tubercles, regarded as fungoid and accompanied with copious fluid effusion, a short double row of small tumors of the same character was found on the pleura, in the course of two of the intercostal arteries. Haller and Laennec speak of fungoid and melanoid deposits to a considerable extent having been found in the cavities of the pleura, on their smooth unattached surfaces. I have never seen any thing of the kind, and am therefore incom-petent to speak of them.

Cruveilhier has given a case of two large tumors occa- Hydatids sioned, as it would appear, by hydatid cysts, and situated beneath the pleura. behind the pleura costalis, one on each side. They were of sufficient size greatly to compress the lungs and impede respiration. In a specimen presented to Guy's Museum by my friend E. C. May of Tottenham, a large cyst, con-taining acephalocyst hydatids, is situated in part beneath the close pericardium about the base of the heart, and partly under the pleura pulmonalis, at the root and summit of the right lung. I have found a cyst containing similar hydatids beneath the pleura pulmonalis of the kangaroo.

LECTURE VI.

ON THE SEROUS MEMBRANES.

THE PERITONEUM.

DEFICIENCY OF THE PERITONEUM, CONGENITAL OR ACQUIRED.— EXCESS — ALTERED SECRETION—EFFECTS OF INFLAMMATION—ON THE FORMATION OF FALSE PARIETES, WITH CASE ILLUSTRATIVE OF THIS REMARKABLE APPEARANCE—UNIVERSAL ADHESIONS OF PERITONEUM — PURULENT COLLECTIONS. —ADMIXTURE OF PLASTIC AND NON-PLASTIC MATTER—PERFORATION OF INTESTINES, WITH ILLUSTRATIVE CASE — TUBERCULATED ACCRETIONS OF THE PERITONEUM, NOTICED BY DR. BARRON — LOUIS'S OPINION, THAT CHRONIC PERITONITIS IS ALWAYS TUBERCULAR—CREPITATION PRODUCED BY PERITONEAL ADHESIONS—NON-PLASTIC PRODUCTS OF INFLAMMATION—GENERAL CONTRACTION ACCOMPANYING THE EFFUSION OF SERUM—CASE ILLUSTRATIVE OF THIS CONTRACTION—PARTIAL INFLAMMATIONS OF PERITONEUM —LOCALITIES MOST FREQUENTLY AFFECTED—COMMENTS ON THE SEROUS OASTRITIS OF NOSOLOGISTS—SEMI-CARTILAGINOUS PATCHES ON THE PERITONEUM — SCABROUS APPEARANCE — DETACHED BODIES IN THE PERITONEAL CAVITY—ASCITES—BLOODY SPOTS — ATTACHED SURFACE OF THE PERITONEUM — ŒDEMA OF THE SUB-PERITONEAL CELLULAR TISSUE — VESICLES AND SEROUS CYSTS FORMED BENEATH THE FREE SURFACE—EFFECTS OF INFLAMMATION ON THE SUB-SEROUS CELLULAR TISSUE—PLASTIC AND NON-PLASTIC EFFUSIONS—LACERABILITY OF SUB-SEROUS AND SUBMUCOUS CELLULAR MEMBRANE—CASE IN EXPLANATION OF THIS PHÆNOMENON—SCROFULOUS AND MALIGNANT DEPOSITS BENEATH THE PERITONEUM —CASE OF MALIGNANT DISEASE OF PERITONEUM—HYDATID OROWTHS— MORBID ANATOMY OF THE TUNICA VAGINALIS—RESULTS OF INFLAMMATION —HYDROCELE—HÆMATOCELE—APPEARANCES ON THE ATTACHED SURFACE —HETEROLOGUE DEPOSITS—SYNOVIAL CAPSULES, BURSÆ MUCOSÆ, &c.— LOOSE BODIES WITHIN SYNOVIAL CAPSULES.

GENTLEMEN,

Deficiency
—congenital.

Examples of the original deficiency of a part of the peritoneum are very uncommon. The only forms in which I have noticed such a preternatural appearance, are, in foetuses formed with a deficiency of a more or less considerable part of the anterior parietes of the abdomen; and in those cases of imperforate anus which depend on the intestines terminating at some distance above this part in a

blind extremity. In this latter case, the deficiency of part of the intestine is of course attended with a want of the corresponding part of the peritoneum.

Acquired deficiencies of this membrane are more often apparent than real. The preternatural shortness of the mesentery, and the almost total disappearance of the omentum, depend on the contraction, rather than on the absence of parts. They are to be regarded as amongst the results of inflammation, and will be considered under that head. We have, however, instances of the loss of a portion of peritoneum in those cases in which a strangulated piece of omentum is excised from a hernial sac.

The examples of a redundancy of peritoneum are not so uncommon. They may be of original formation; as when a portion of intestine, which in most cases is bound down to the parietes, has a more loose connection, by means of a fold of peritoneum in the form of mesentery, meso-colon, or meso-rectum; or where the omentum is of unusually large size. The peritoneum exhibits an acquired increase of size or extent from effusions into its cavity—from the developement of tumors—and in the different varieties of hernia; in which we have not only the extension of the membrane into a new process forming the sac, but the portions of peritoneum supporting the protruded viscera are also extended, and occasionally cysts of large size are formed within the hernial sac.

The secretion from the surface of the peritoneum is, like that of the other serous membranes, liable to various alterations. It is sometimes deficient, leaving the membrane nearly or quite dry. This is occasionally seen, to a limited and partial extent, upon or near portions of intestine distended with gas. It may, I believe, in most of these cases, be regarded as cadaveric; yet it is by no means improbable, that something of this kind may take place during life, and that it is a precursor to inflammation. The secretion is sometimes greatly increased, constituting ascites, of

which I shall speak hereafter. It may also be changed in
quality; and become viscid and mucous, or tinged with blood
or bile.

Effects of
inflamma-
tion.

The smooth surface of the peritoneum, under inflamma-
tion, exhibits, in a well-marked manner, the different va-
rieties of the plastic and puriform effusions to which I have
already so repeatedly directed your attention. Layers and
bridles of adhesion, and pouches or cysts of various forms,
afford the best specimens of the most perfectly plastic form
of inflammation occurring in the peritoneum. In its gene-
ral characters, the production of such false membranes is in
strict accordance with the description which I have given in
my general remarks.

Formation
of false
parietes.

When the coagulable matter, in a more or less plastic
form, exists in large quantity, it often exhibits a pecu-
liarity, which, though it well merits attention, I have not
seen particularly described by any author. Whilst it
firmly unites the intestines, and dips in between their con-
volutions, it presents an even surface to the parietes, and re-
mains unattached to them, except at the margin of the layer
formed by the adventitious deposit. In this way, a new
shut cavity is formed, which is probably not only occa-
sioned by, but also facilitates, the movements of the abdomi-
nal muscles. I believe that I cannot better illustrate this
fact, than by reading to you an extract from the rough notes
which I made of the first case in which I observed this pe-
culiarity. I have since seen it in several other instances.

Case.

" A young man, a patient in La Charité, during the
season of 1821-2, had been long ill, and was extremely
emaciated. His complaint had been peritonitis, which had
terminated in effusion. Some time before death, paracen-
tesis had been proposed; but this was objected to, and lini-
ments were employed. The effusion was to a great de-
gree absorbed; and when the body was placed on the table,
it had not at all the appearance of being distended. For a
considerable time, diarrhœa had been very urgent, disturbing

the patient sometimes thirty times in the course of the day. In opening the abdomen, the lower part was the first cut into. A fluid escaped, opaque, and of a light-brown colour, very much resembling yeast diffused through water. On raising the parietes, an extended mass, of the same colour as the fluid mentioned above, concealed every thing from view. It appeared to be evidently a new production, and not a degeneration of the omentum; although its not extending higher than the arch of the colon might favour such an idea. Its under surface was smooth, like a serous membrane; but it appeared perfectly detached. The upper surface was rough, and, on this side, the mass very much resembled a coagulum of milk curdled by treacle. The edges were ragged, and indeterminate, with many flocculi of the same matter floating about in the fluid, which appeared to owe its colour to minute particles of this substance diffused through it. When these matters were removed, the intestines continued concealed from the arch of the colon, to which the abdominal muscles adhered throughout, down to the pubes. They were covered by false parietes, opaque and smoothly extended, so as to hide even the form of their convolutions. There was thus formed an adventitious shut sac, occupying by far the greater portion of the anterior part of the abdomen, into which none of the viscera penetrated, but which contained merely the fluid and the singular mass above described. On cutting into the layer which covered the intestines, it was impossible to say whether it was the omentum altered by the disease, or entirely a new production: there was, however, nothing else which could be considered as the vestige of the omentum." I had not at this time particularly noticed the contraction and almost total disappearance of the omentum in cases of peritonitis which have been accompanied by copious effusion, but of this I shall speak hereafter. "The intestines were implicated in numerous and strong adhesions; and a vast number of tubercles, some of considerable

size, were scattered under the peritoneal coat. The mucous
membrane of the colon was reddened throughout a consi-
derable part of its course."

Conditions
essential
to the for-
mation of
false pa-
rietes.

It seems to be essential to this result of peritonitis, that
there should be a considerable quantity of the coagulable
matter effused at once. Where it is in smaller quantity,
forming bridles of greater or less thickness and extent,
these bridles are not merely found passing from convolution
to convolution, but they also become attached to the pa-
rietes. This difference between the two cases is well wor-
thy of attention. Were the extensive surface, which the
false membrane presents in the one case, to become ad-
herent to the parietes, their motion, so essential to the
function of respiration, would be materially interfered with.
In the other case, this effect is not to be apprehended from
the partial adhesions in the form of bridles.

Universal
matting to-
gether of
intestines
and pa-
rietes.

Cases however do occur, in which we find the convolu-
tions of the intestines not only united and matted together,
but firmly and generally adherent to the parietes. Such
cases I have principally met with amongst children of a
scrofulous constitution ; and their illnesses, which had been
lingering and tedious, had not commenced by a well-marked
attack of peritonitis. A part of the product of inflamma-
tion in these cases, though concrete and translucent, is short
and fragile, without appearance of organization ; and fre-
quently sprinkled with numerous masses of tuberculous
matter. There may, however, be some films of a more de-
cidedly membranous or plastic character ; since, as I ex-
pressly noticed in my general remarks, the successive
attacks of inflammation of a serous membrane, in which
resolution does not take place, do not give rise to the same
products in each. In these cases, it is by no means unfre-
quent to find the intestine perforated by ulceration, which
sometimes forms communications between contiguous con-
volutions. Such ulcerations are favoured, not only by the
collections of tubercular matter implicated in the false mem-

brane, but by depositions of the same description beneath the peritoneal coat. Artificial anus is sometimes produced by such ulceration; making a communication between the intestine and the parietes, instead of between two contiguous convolutions.

It is in the abdomen that we particularly notice those collections of coagulable matter which I have described as becoming organized externally; whilst internally, in consequence of this process not being set up, puriform collections are formed. These collections, which vary in size from that of a pea to that of an orange, take place in those situations in which the concrete part of the inflammatory effusion is most considerable: hence they are most frequently met with in the lateral and angular parts of the abdomen, between the convolutions, and along the thicker edges of false membranes. They may be formed in cases in which the peritonitis appears to have been productive of an effusion, at first, of a very plastic character. These purulent collections are attended with ulcerative absorption; first, of that part of the serous membrane with which they are in contact, and afterwards of the parts subjacent to it. Now, if any accident tear through the feebly-organized exterior of the matter uniting the convolutions between which such collections exist, we have an opening into the intestine, formed from without, inwards, and effecting a communication between the purulent collection and the intestinal canal. A very illustrative case occurred in a female who was attacked with peritonitis towards the latter period of pregnancy. Premature labour, which took place some time after the attack, led to her death; and the following appearances presented themselves, on inspection:

The body was still warm. The cutis over the abdomen was remarkably brown. Emaciation was considerable. The head was not opened. The contents of the chest were generally healthy: there was merely a little pleuritic adhesion, not recent, at the upper part of the right lung, and also some at

its base.   In opening the abdomen, between the umbilicus
and pubes, the scalpel entered a cavity occupying almost
the entire pelvis.   It was about half filled with fæculent
matter, which had escaped from the intestines.   The intes-
tines were prevented from falling into the pelvis by the
false membrane which formed the walls of this cavity, and
restrained its contents from invading the other parts of the
abdomen.   There were numerous small ulcerated openings
in the upper part of the cavity, which communicated with
the interior of the small intestines, especially with the last
part of the small intestine, which, firmly united by adhe-
sions, contributed chiefly to form the parietes of the cavity
at this part.   There was a much larger opening quite at
the lower part of the colon, just above the promontory of
the sacrum.   There were also two considerable cavities,
behind the peritoneum, in the pelvis; the larger, anterior;
the other, posterior, and to the left.   They contained fluid
fæculent matter, and freely communicated with the principal
cavity.   Although the rest of the abdomen was shut off
from that part into which the fæcal matter had escaped, it
bore universal marks of peritoneal inflammation.   There
was no effusion; but general adhesion, which was extremely
delicate about the liver and spleen and all the upper part
of the cavity, and, throughout the lower part, much more
copious, in the form of membranes, and bridles of a black-
ish or dark grey colour.   Between the united convolutions
there were a few small circumscribed collections of matter;
and one in the left Iliac region, containing about an ounce
of pure thick yellow pus.

The mucous membrane of the stomach appeared healthy:
that in the pylori-valvular part of the duodenum was red-
dish, somewhat thickened, and granular.   The lower portion
was of a bright red, and very vascular. The greater part of the
mucous membrane of the small intestines appeared healthy:
it contained thick, whitish, viscid mucus: its minute vessels
were, in many parts, injected with darkish blood, apparently

from congestion, rather than inflammation. The glandulæ aggregatæ were, to a very slight degree, thickened; and the minute black points, regularly dispersed over them, evinced the pre-existence of irritation, which had subsided. Nothing like ulceration could be detected in that part of the intestine which did not communicate with the cavity containing pus, and even in the perforated part, the apertures had perfectly clear defined edges. The mucous membrane presented no derangement of texture, and was in many parts quite pale. The large intestine also appeared healthy; but in its lower portion it had rather a leaden hue. The liver and spleen were healthy. The kidneys were of a lighter colour than is quite natural: imbedded near the surface of the left, there were several small transparent cells, containing limpid fluid. The uterus, which formed a part of the bottom of the cavity containing fæces, was but imperfectly contracted, being about twice the size of the unimpregnated state: it was flat, and compressed: its parietes little if at all thickened: its interior, uneven, of a dark colour, and containing dark, grumous, bloody matter. The os uteri was imperfectly closed.

When the coagulable matter which is effused by an inflamed peritoneum, constituting adhesions between the viscera of the abdomen, contains a considerable admixture of inorganizable matter, this latter is often found collected in small masses, having very much the character of tuberculous matter. Sometimes they seem pretty uniformly and thickly diffused through the false membrane, and appear to have constituted a part of it from its very formation. In other cases, the membranes, bands, and bridles, produced by peritonitis with effusion of the most plastic form, are seen to be studded with well-defined, rounded masses of tuberculous matter, of various sizes. In these cases, I apprehend that the process of organization of the false membrane may have been suspended, as in the case of the purulent collections which I have already described. The pro-

Admixture of plastic and non-plastic matter.

L

cess of ulceration, however, which the presence of the
inorganizable matter produces in these instances, appears
to be much less active than is the case with the purulent
collections, and more nearly resembles that which we find
taking place in the substance of the lungs. The deposit
continues to increase; and very often does not pass into the
stage of softening until a considerable mass is formed : but
when the process of softening has taken place, the coats of
the intestines are not unfrequently altered in texture, and
are perforated.   We have, then, another feature of resem-
blance between these serofulous tubercles in the false mem-
brane investing the peritoneum, and the before-mentioned
collections of pus.

  Andral has related several instances of perforation of the
intestines from without inwards, effected by softening of
the kind which I have described.   The following well-
marked case was inspected by myself; and, as I have met
with several instances in which appearances of this kind
were more or less strongly marked, they must be regarded
as constituting a morbid appearance of far from uncommon
occurrence.

Case.   A little boy, of nearly five years of age, a patient of Dr.
Clark, in Percival Street, Goswell Street, had been habi-
tually subject to costive bowels.   He had generally an ex-
cessive appetite, which he had been allowed too freely to
indulge.   He was thin, and his intellect was active and
premature. For the last six months he had been constantly
ill, obviously labouring under an affection of the abdomen,
which was much distended and somewhat tender on pressure,
and, toward the latter part of the period, presented partial
and tolerably-defined indurations, which did not excite the
idea of their being deeply situated.

  On examination, the peritoneum was found exhibiting
universal adhesions, which were evidently of long standing,
and had, for the most part, completely assumed the appear-
ance of cellular membrane, especially about the intestines.

mesentery, and mesocolon. Where this adventitious membrane united the liver and spleen to the parietes, it was more close and dense. The omentum retained its natural position, extending over the convolutions of the intestines, but it was united by adhesions to the intestines, and likewise to the parietes. The intestines were inextricably bound together. The omentum, and also the adventitious membranes constituting these adhesions, were generally of a leaden hue. The latter was thickly sprinkled with collections of a light-coloured inorganized matter of a tuberculous character, and varying in size from that of a millet-seed to that of a chesnut. In some parts where the intestines were glued to each other or to the parietes, the uniting medium, instead of cellular membrane, was a close and compact structure, in considerable quantity, and of very feeble tenacity. Any attempt to separate these adhesions readily opened a way into the intestinal tube. It was one of these adhesions, situated a little to the right of the umbilicus, which had given rise to the principal induration which had been felt during life. The mucous membrane of the stomach and intestines was generally pale and healthy: it was perforated at the spots where some of the last-mentioned adhesions existed, and the margins of these openings were marked by a line of light red. The mesenteric glands were not diseased. The liver and spleen offered nothing remarkable, except the peritoneal adhesions already noticed. The kidneys were rather pale.

This case bears a close resemblance to some of those which are related by Dr. Barron, under the title of 'Tuberculated secretions of the peritoneum.' Under this head, the Doctor has obviously drawn together some very dissimilar affections. I shall reserve for another occasion the examination of the views of this pathologist; and, on the present occasion, shall only notice the doubt which he has thrown on the inflammatory nature of several cases in which the viscera of the abdomen, but especially the convo-

lutions of the intestines, were found more or less firmly
united together by adventitious matter, either in the form
of membranes or bridles, and often conjoined with va-
rious tuberculated deposits. It is true, that in many of
the cases related by the Doctor, as well as in that of which
I have given the details, the symptoms of acute inflamma-
tion had not been noticed, rendering it difficult to assign
the precise time at which the effusion of coagulable matter
had taken place : yet we must remember, that undoubted
cases of acute peritonitis are by no means unfrequently
occurring, in which pain is wholly, or to a great degree,
absent ; and that the nature of these cases has consequently
been undiscovered. I cannot give a better illustration of
the obscurity which sometimes attends these cases of peri-
tonitis, than the following occurrence, which took place in
one of the Clinical Schools at Paris. Amongst the patients
of a distinguished teacher, was a female, whose case not
merely baffled the diagnosis of the pupils appointed to
record and watch, but completely puzzled the Professor
himself, and induced him to call in to his assistance his dis-
tinguished master, Pinel. The diagnosis of peritonitis,
which was instantly given by this veteran physician, and
which inspection subsequently fully verified, was founded
on the peculiar physiognomy of the patient, rather than on
any symptoms immediately connected with the abdomen.
The absence of pain, then, and of other symptoms of peri-
tonitis, are by no means sufficient to warrant the conclusion
that inflammation of this membrane has not existed. On
the other hand, the close resemblance to be observed be-
tween the adventitious matter constituting the variously-
formed adhesions of which we have been speaking, and
those which follow the best-marked and most undoubted
cases of peritonitis, leave no hesitation in my mind as to the
important part which inflammation has acted in the cases in
question.

The production of scrofulous tubercles, which may be

often witnessed in the substance of false membranes formed
on the surface of the peritoneum, is well worthy the atten-
tion of those who have attempted to attribute a glandular
origin to all scrofulous tubercles, since it appears to be an
insurmountable argument against the truth of such a doc-
trine : for none, I imagine, will venture to contend for the
accidental production of a glandular tissue in such mem-
branes.

Professor Louis, who has paid much attention to the
subject of peritonitis, has observed, that, within the range of
his observation, all cases of chronic peritonitis are tubercu-
lar. My own inspections would lead me also to the conclu-
sion, that chronic peritonitis is very frequently conjoined
with tubercles : yet this concurrence has not been so uni-
formly supported by cases observed in this country, as it
has been by Louis's cases. That form of peritonitis which
is accompanied by copious effusion, and which might easily
be regarded as ascites, occurs without any appearance
of tubercles. The same may be said of other cases, in
which the concrete product of inflammation has been more
considerable. Since the assertions of Louis have a just
claim to importance and respect, from the abundance of
valuable evidence by which they are supported, I have
thought it necessary to notice the occasional exceptions to
this rule with respect to peritonitis, whilst I confirm the
frequent occurrence of the combination which he has de-
scribed.

Chronic pe- ritonitis — always tu- bercular ?

Scrofulous tubercles of various appearances and different
sizes are not the only adventitious productions met with in
conjunction with peritonitis. Scirrhous and fungoid masses
and tubercles connected with the peritoneum are found
accompanied with more or less abundant effusion, and with
bridles and films of adhesion, which sufficiently attest the
co-existence of chronic inflammation with these growths.
In such cases, however, the peritonitis may be regarded as
a secondary affection.

Malignant tubercles productive of perito- nitis.

In whatever mode partial adhesions are brought about, and whether they are connected with adventitious structures or not, their formation appears to be accompanied, at an early stage, by a remarkable symptom, which Dr. Bright has had the merit of pointing out. He describes it, as consisting in a peculiar sensation conveyed to the hand, when pressing the abdomen in a mode calculated to promote motion between the parietes and subjacent parts. He compares it to obscure crepitation from emphysema, and to the effect produced by the bending or flection of new leather. By another gentleman, it has been compared to the effect produced by the friction of a pane of glass with a wetted finger. This symptom appears to be limited to a few days' duration, and seems to depend on a particular state of the product of inflammation shortly after its formation. It also appears to be essential that the effusion should be of that plastic character which is competent to form adhesions. I have not myself had the opportunity of becoming personally acquainted with this interesting and curious phænomenon, and do not fully understand the mode by which it is brought about; but I apprehend that it is perfectly analogous to a symptom observed, in some cases of recent pericarditis, by Collin, who has described it by the same simile as that employed by Dr. Bright. In both of these cases, the recent product of inflammation is subjected to motion with pressure. In the formation of adhesions of the pleura, these two circumstances are not likely to be combined; which may account for the symptom not having been noticed in the pleura, notwithstanding its extreme liability to adhesions.

Non-plastic
product of
inflamma-
tion—in the
form of pus;
I must now solicit your attention to those cases in which the inflammatory effusion into the cavity of the peritoneum, instead of merely presenting a partial admixture of inorganizable matter, consists, either wholly or principally, of this substance. Although persons of all ages and descriptions are liable to this form of peritonitis, it appears certain that some individuals are more particularly disposed to it than

others; and it would seem that injury to, and disease of, the pelvic viscera are the most frequent of the exciting causes. It has, I believe, in most cases, been a peritonitis of this kind which has fatally supervened on parturition; and the turbid and whitish, not to say purulent, effusion which has accompanied it, has led to the absurd idea that milk had been transferred from the mammæ to the cavity of the peritoneum. I have repeatedly met with cases which appeared to bear a very close analogy to puerperal peritonitis, in males labouring under disease in or about the bladder. Some of these were of the class already mentioned, in which the degree of pain is by no means proportioned to the degree and extent of the inflammation.

It by no means unfrequently happens, that the quantity of serous effusion bears a very large proportion to that of the coagulable matter. This form of peritonitis is very apt to assume a chronic state; from which cause, as well as from the imperfectly characterized or ill-observed symptoms of inflammation which attended the attack, it is often very difficult, if not impossible, to distinguish this affection during life, from cases of purely hydropic or atonic effusion. It may, I think, be truly said to constitute the most obstinate and distressing form of ascites. It has, however, been questioned, whether the term 'ascites' ought to be given to these effusions; and in an elaborate Thesis by Dugés, an inquiry is instituted into the possibility and means of distinguishing the two affections, during life. But, after all the pains which the author has bestowed on the subject, it must be confessed that much difficulty at times unavoidably attends the diagnosis. It is difficult, even on inspection after death, to draw, in all cases, the line of demarkation; for, as I have remarked with respect to effusions into the pericardium and the pleura, so also in the peritoneum, the atonic and those of an inflammatory character pass insensibly into each other. The small quantity of tender false membranes which we so frequently meet with when the serous effusion is very

in the form of serum.

copious, although they must unquestionably be referred to an inflammatory origin, are, in many cases, to be regarded rather as the result of a secondary action, which the presence of the fluid has excited in the peritoneum, than as indicating that the effusion was originally of an inflammatory nature. In those cases in which the peritoneal effusion is to be attributed to chronic peritonitis, a false membrane, which is often of great tenuity, but closely adherent to the serous membrane, may be detected wholly, or to a considerable extent, investing the surface of the peritoneum.   The omentum is contracted, or corrugated and folded up, under the greater curvature of the stomach ; and at times reduced to so small a compass, as to be scarcely recognizible.   If old adhesions have partially fixed the omentum to some part of the pelvis—which is particularly frequent in females, in whom the adhesion of the omentum to the uterus probably takes place during pregnancy—the omentum, instead of being wholly drawn up under the stomach, is found extended, in the form of a cord, between the stomach and the part of the pelvis to which the adhesion had been formed.   Besides the contraction of the omentum, the mesentery is found more or less shortened, by which the intestines are drawn up to the spine ; and, if a hernia had existed, it will sometimes be found to have been completely reduced.   The intestines are more frequently reduced in length than contracted in their calibre.   In extreme cases, they probably lose nearly or quite half their dimensions, and the valvulæ conniventes are consequently placed very closely to each other.   This contraction of the omentum, mesentery, and intestinal canal, is, I believe, perfectly analogous to the contractions of the chest which I have noticed as occurring after pleurisies ; and seems to depend on the contractions which newly-formed parts undergo after they have become organized or permanent, as we see in the large cicatrices of extensive burns.   In the instances now before us, the contraction appears to depend in part on the false membrane

Contraction accompanying inflammation with serous effusion.

covering the peritoneum, and partly on the deposit on the
attached surface.   It is also evident, that the original struc-
tures are themselves reduced by absorption; partly under
the influence of the contraction of the adventitious deposit,
and partly under the pressure of the fluid effusion.   I am
not aware that these contractions, resulting from chronic
peritonitis, have been either noticed or explained by any
author; except that Dr. Baillie has mentioned, that the
omentum is occasionally found, in the form of a thick cir-
cumscribed mass, lying under the greater curvature of the
stomach; and has attributed this state to the extravasation
of coagulable lymph into the cellular membrane between
the lamellæ of the peritoneum.

As we shall see, in the case which I am about to relate—
in which most of the appearances, just described, presented
themselves in a remarkable degree—there was obviously
no deposit within the omentum.   John Holbeach, rather
above the middle age, died in Job's Ward, 24.11^{mo} (No-
vember) 1825, having long laboured under anasarca, with
copious effusion into the peritoneum.   The subject was
above the middle size, and of unusual weight and cor-
pulence.   On the exterior, there were considerable abra-
sions of the back, with redness and ulceration of the
lower extremities.   The abdomen was of very large size.
An opening being made into it, between four and five
gallons of serum were withdrawn, by means of a syringe.
The intestines were not observed to be floating in the
serum, as is often the case in ascitic subjects: no omen-
tum covered them; and they did not fall into the pelvis.
The rectum alone was to be seen in this part of the abdomi-
nal cavity.   The other intestines were unusually bound
down to the spine.   With the exception of the transverse
colon, there was little difference to be observed between
the large and the small intestines; the former being shrunk,
and retaining but slight traces of the appendices epiploicæ,
while the latter were somewhat distended.   They were

*Case illus-
trative of
this phæno-
menon.*

both of an unnatural leaden colour, and preserved their
cylindrical form as if distended by their contents. The
tranverse arch of the colon was of the usual thickness, but
short, and drawn up immediately under the liver; by which
it was partly concealed. A light-coloured ridge, scarcely
so thick as one's little finger, extended along the greater
curvature of the stomach, which was very much concealed
by the colon and liver. The liver appeared rather shrunk:
its surface was botryoidal or reniform; and was of a white
colour, as was also the gall-bladder. On removing the vis-
cera from the abdomen, the alimentary canal appeared to be
unusually short. The mesentery and mesocolon were ex-
tremely short, accounting for the intestines appearing bound
down to the spine. An adventitious membrane extended
over the whole peritoneum, without forming bridles uniting
the intestines, and appeared, at first, like a mere thickening
of the serous membrane; but, with a little care, it might
satisfactorily be separated from it. It was particularly thick
on the liver, giving it its white colour. It was somewhat
thinner on the intestines, allowing their dark coats to be
seen through it. It was thinnest on the parietes, where its
existence could scarcely be shewn. On removing this mem-
brane from the before-mentioned line passing along the
stomach and colon, the omentum was discovered within it,
folded together, and reduced to a mere rudiment. The
mucous membrane of the alimentary canal appeared to
have been the subject of much venous congestion; and
in the stomach, it was of a darkish grey colour, from depo-
sition of carbonaceous matter. The thickness of the coats
of the intestines was principally owing to their being
shortened, and to their œdematous state. The surface of
the liver seemed to announce the existence of numerous
large tubercles imbedded in its structure: such, however,
did not prove to be the case. One nearly uniform derange-
ment pervaded the entire substance of the organ. Its cel-
lular tissue had undergone a fibro-cartilaginous degenera-

tion, and, being increased so as to constitute the greater part of the organ, rendered it extremely hard and dense; and compressed the glandular structure, which had become of a pale yellow colour. Notwithstanding this degeneration, bile of a tolerably healthy character was secreted. The spleen, though of a dark colour, retained its structure, with little or no alteration. The kidneys seemed to have a more venous hue than is natural to them, but in other respects might be considered healthy. Nothing particular was remarked in the pancreas. There was a considerable quantity of fluid in the pleuræ, but apparently of no long standing, as the structure of the lungs appeared no where condensed by its pressure: they were rather œdematous, especially the right. The heart might be considered of the natural size, for the age of the patient.

I have inspected and recorded several instances of similar contraction of the omentum and mesentery; and some of the cases are illustrated by Preparations in the Museum.

Before I proceed to speak of the appearances which inflammation produces on the attached surface of the peritoneum, I must say a few words respecting partial inflammations of the polished surface. Like the partial inflammations of this description which occur in the pleura, they appear to be more often the effect of a local than of a general cause; and hence we find, that certain parts of the peritoneal surface are more liable than others to become the seat of these limited inflammations; as, the convex surfaces of the liver and spleen; the right Iliac fossa; and, in females, the broad ligaments and Fallopian tubes, the parts immediately adjoining them, and the space between the uterus and rectum. *Partial inflammations of peritoneum.*

The partial inflammation on the convex surface of the liver is, I believe, to be referred to some derangement existing in this organ itself; although it may have been of so slight and transient a nature, as not to have left any traces of its existence in the glandular structure. The jaundice, *Inflammation of, 1. Hepatic peritoneum;*

and the fulness and weight of the right hypochondrium, which accompany the attacks in which these inflammations are supposed to exist, appear to me to favour this view of their origin. When inflammation is seated between the convex surface of the liver and diaphragm, adhesions are produced, which generally assume the form of long slender filamentous bridles; in consequence, as it would seem, of the constant motion which takes place between the affected surfaces.

2. Of the splenic pe- ritoneum;   The peritoneal inflammations which take place in the neighbourhood of the spleen appear, like those just described, to owe their origin to causes existing in the subjacent organ. It is manifest, however, that both these partial inflammations in the neighbourhood of the spleen, and the derangements of this organ which accompany them, are generally attended neither by well-marked nor serious symptoms: for, although adhesions on the convex surface of the spleen are perhaps only second in frequency to adhesions of the pleura, it is comparatively rare that we hear of patients labouring under splenitis. This fact, I conceive, can only be attributed to the low degree of sensibility, and very feebly-marked sympathies of this organ, whose obscure functions have so long puzzled physiologists. It can scarcely escape observation, that there are numerous individuals, both males and females, but especially the latter, who, without considering themselves sufficiently indisposed to interrupt their ordinary avocations, are very subject to uneasiness, amounting to a pain or stitch in the region of the spleen, or who find it difficult to recline on that side. I suspect that many of these cases are connected, either with old adhesions on the surface of the spleen, or with the inflammatory attacks which have a tendency to give rise to them. The relief afforded by leeches or cupping seems to favour such an idea.

3. Of the peritoneum in the Iliac fossa;   The partial inflammation of the peritoneum, in the Iliac fossa, is sometimes set up by disease in the Appendix

cæci. If this be inconsiderable, it may merely give rise to some very limited partial adhesions: at other times, the Appendix having been perforated by ulceration, occasioned by the lodgement of fæcal concretions in its cavity, extravasation takes place, and inflammation of a more severe and serious kind is originated. Even in these cases, nature sometimes succeeds in limiting the inflammation to a part of the right side; but it is at other times diffused over the whole of the abdomen, is accompanied by symptoms of the most serious nature, and quickly proves fatal.

The peritoneal adhesions in the neighbourhood of the appendages of the uterus appear in most cases, like those occurring in the neighbourhood of the spleen, to be not accompanied by any marked or serious symptoms. From the character of the individuals in whom they are most frequently found, it is rendered extremely probable that they are induced by the inordinate exercise of the parts which they implicate. It is obvious, that, in many cases, they must afford an effectual and permanent obstacle to conception. That the effect of partial peritonitis should frequently be met with, in the form of a more or less inorganizable product of inflammation, deep in the cavity between the uterus and the rectum, may be attributed to two or three causes. In the first place, being nearly or quite the lowest part of the abdominal cavity, it receives the product of secretion or inflammation from other parts. Secondly, when this product is so collected, it is liable to become a source of irritation, which not only prevents absorption, but adds to the effusion. The third, and perhaps the most important circumstance is, that inflammation may be communicated to this part from the uterus itself. We know that such communication is by no means unfrequent in the serous membranes. The os and cervix, from their more complicated structure, from their function and greater exposure, are unquestionably the parts of the uterus most liable to become diseased. The movements of

4. Of the uterine peritoneum.

Causes of the frequency of adhesions about the uterus.

this part, occasioned by the expulsion of the fæces, and
even by more inconsiderable but more frequently-repeated
causes, must have no little influence in keeping up inflam-
mation, when once induced.

Next to the parts which I have now mentioned, the sur-
face of the small intestines appears to be the most prone to
peritoneal inflammation. The mesentery and mesocolon,
in these cases, very frequently escape, probably from the
same cause as that which protects from pleuritis the inter-
lobular fissures of the lungs.

Parts most
rarely
affected.

The peritoneum lining the parietes, and covering the
stomach and the urinary bladder, appear to be the parts of
this membrane which most rarely become idiopathically
inflamed. The constant variations of distension and con-
traction, to which they are exposed, probably tend to
diminish their sensibility, and confer upon them their com-

Serous
gastritis.

parative immunity from inflammation. From the remark
which I have just made, it will be, perhaps, inferred, that I
regard the inflammation of the peritoneum covering the
stomach, or what is called serous gastritis, as a very rare
affection. It is indeed so rare, that I do not wish this impor-
tant fact to be left to mere inference. I believe serous gastri-
tis to be little more than a mere nosological division, em-
ployed by systematic writers and teachers; whilst the disease
represented by it scarcely exists, save in theory. The sym-
ptoms supposed to characterize this affection may be occa-
sioned by the state of the internal surface; or they may even
be produced by that of remote parts, with which the stomach
is closely connected by its mysterious sympathies; as in the
case of the urgent vomiting, and other symptoms of diseased
stomach, which occasionally exist during pregnancy, or in
conjunction with uterine disease. The records of inspec-
tions in which false membranes, or other products of inflam-
mation, have been found upon the serous surface of the
stomach, do not invalidate the assertion which I have made:
they may arise from coagulable lymph or puriform matter

having been conveyed from other parts of the peritoneal surface. The partial inflammation of the peritoneum, affecting the serous surface of the stomach, may however exist, as a secondary affection; and be induced by corrosive poisons taken into the stomach, or by the ulceration of the internal surface, producing or approaching to perforation.

A peculiar result of peritoneal inflammation is sometimes met with in certain parts to which it may be regarded as almost exclusively confined. The appearance consists in a very remarkable semicartilaginous thickening, interrupted by spots, having a circular figure and small size, at which the thickening is either very inconsiderable or wholly wanting: they may be either distinct or confluent. The surface so affected has a worm-eaten or honeycomb appearance. The parts of the abdomen in which this is met with, are, the surfaces of the liver and spleen. I do not remember to have myself inspected, or to have witnessed an inspection of a case in which the production of this appearance was in progress; but, from the strong resemblance which the affected surface bears to a condition of the pleura which I have already mentioned, I am led to believe that the depressions are occasioned by a small collection of inorganizable matter, interfering with the deposition of the more plastic matter on which the surrounding thickening depends.

Insulated semicartilaginous thickening of peritoneum.

The scabrous product of inflammation is seldom seen on the surface of the peritoneum with appearances perfectly similar to those which we meet with on the pericardium and pleura; but where the serous effusion has been considerable, with few if any flakes of coagulable lymph, I have seen numerous small elevations, frequently possessing some degree of opacity, and without the regular arrangement which is sometimes met with in the two other serous membranes alluded to. The roughness of the peritoneum, now under consideration, has been frequently met with upon the convex surface of the liver, on the corresponding surface of the diaphragm, and on the anterior parietes. This

Appearance of peritoneum resembling scabrous product of inflammation.

state of the peritoneum appears to form an approach to the deposition of scrofulous tubercles. Genuine scrofulous tubercles are generally met with beneath the serous membrane; and must be spoken of in conjunction with other derangements in that situation.

Malignant growths on free surface of peritoneum.

I have seen two instances in which the free surface of the peritoneum appeared to be deranged by malignant disease. One of them occurred in a young man who died of fungoid disease of the kidney. In addition to numerous small malignant tubercles situated in or beneath the peritoneum, the free surface was thickly set with short slender ramifying filaments, slightly enlarged at their free extremities, and bearing a close resemblance to some fungoid growths from the mucous membrane of the urinary bladder. The other case occurred in a female about forty years of age, who died after having presented symptoms of acute peritonitis supervening on abdominal tumors of rapid formation, supposed to be ovarian, and situated in the right Iliac region. On inspection, a fungoid tumor was found affecting the right ovary, or in the folds of the broad ligament on that side. Numerous small fungoid tubercles were very thickly placed on the attached surface of the peritoneum covering the intestines, and elsewhere. The most remarkable appearance, however, was exhibited by the product of inflammation on the free surface : it appeared almost entirely to consist of a feebly concrete substance, in the form of globular masses of a lamellar structure, and exhibiting traces of that arrangement which I shall more fully explain in a future Lecture.

Detached bodies in peritoneum.

Perfectly detached concretions of a rounded figure, and of a semicartilaginous, or, in some instances, of a bony character, are occasionally met with in the peritoneal cavity. With respect to their nature and mode of production, I need not repeat what I have already stated on this subject in my general remarks on the serous membranes, and also in my last Lecture. In the peritoneum, I have met with these

concretions in three different situations. I found one, of the size of a marble, between the folds of the greater omentum, which were remarkably free from adhesions: it was therefore evident that there had not been any considerable peritonitis connected with the production of this concretion; but there was one spot, resembling an old cicatrix, which induced me to doubt, whether, in this instance, the concretion might not have been produced by the effusion of a small quantity of blood from an injured spot, rather than of plastic lymph from an inflamed surface. In another instance, two small bodies, in figure and size resembling peas, were found in the pelvis: and I have met with at least three or four instances, in which rounded bodies, of about the size of a marble, and of the character before described, were found imbedded in the convex surface of the liver, between it and the diaphragm: they might have been easily mistaken for a kind of tubercles, had it not been evident, on careful inspection, that they were external to the liver, and only connected with its surface by slight and adventitious adhesions.

Hydropical effusions in the peritoneal cavity are of very frequent occurrence, and may depend on any of the causes which are apt to give rise to these effusions; such as, disease of the heart or lungs, disease of the liver attended with obstruction, and, more especially, that state of the kidneys pointed out by Dr. Bright. Exposure to cold is one of the most common exciting causes; and may bring the disease into existence, independently of any of the other causes to which I have alluded. Although the effusion may have been commenced independently of inflammation, the effused fluid is very likely to set it up, in a chronic form. The contraction of the omentum, appendices epiploicæ, and mesentery, are, perhaps, the most common results of this continued but low degree of inflammation. The quantity of serum which may be effused in cases of ascites is often very considerable. Many gallons have been drawn off by

Ascites.

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paracentesis. Portal states, that upwards of six gallons have been drawn off at one operation. Very considerable hydropic effusions into the peritoneum have often been satisfactorily removed by absorption, even when complicated with organic disease of the liver.

Bloody spots on the peritoneum. The peritoneum is sometimes found sprinkled with small bloody spots, in consequence of purpura. I have more than once seen this appearance in conjunction with jaundice. From this cause, blood may be found mixed with the secretion in the peritoneal cavity. Blood is more frequently, as well as more abundantly, found in this cavity, in consequence of violence to the liver or spleen, of wounds of the abdomen, or of the bursting of aneurism. Chyle has been said to have been found in the abdomen. Such an occurrence is just possible, from the rupture of the receptaculum chyli; but it is more probable that some form of non-plastic inflammatory effusion may have been mistaken for chyle. We cannot-doubt that a similar mistake has been made in those cases in which milk is reported to have been found in the abdomen. When air is found in the peritoneal cavity, it must, in most cases, be the result of decomposed secretion, or of perforation of the alimentary canal. Whether it ever proceeds from any other cause, is rather doubtful.

Morbid anatomy of the attached surface of the peritoneum. I shall now proceed to speak of the morbid appearances seen on the attached surface of the peritoneum. From the great extent of this surface, but more particularly from the variety of the parts to which it is applied, and the different degrees of intimacy with which it is united to them, it presents, in different parts, a considerable variety in its proneness to disease, as well as in its appearance under morbid action. Dalmas, jun., who has specially treated of the diseases of the sub-serous and sub-mucous cellular membrane, has laid great stress on the degree of laxity and vascularity of this structure; and particularly alludes to that situated beneath the peritoneum. Although I perfectly agree with him, in thinking that the proneness to disease in this struc-

tture bears an intimate relation to its laxity and vascularity,
yet I think he has considerably overrated both the degree
of exemption which he considers the smooth surface to
possess, and the increased liability of the attached surface
in those situations in which the laxity is most considerable.
For example, he describes it as extremely rare for the
mesentery and omentum to produce false membranes, or
acquire adhesions on their surface. All their alterations,
he says, take place within their substance. These are asser-
tions to which I must offer a modified dissent. I have
already remarked, that adhesions between the omentum and
the viscera in the pelvis are by no means rare; and I have
occasionally seen its posterior surface almost universally
attached to the intestines. It is true, that the layers of the
mesentery rarely become united; but I have both explained
the cause to which this exemption may be attributed, inde-
pendently of any peculiarity in the attached surface; and
have also brought forward examples in which such adhe-
sions had actually taken place. In the pelvis, in which the
sub-serous cellular structure is more abundant, lax, and
vascular than in the omentum, adhesions and false mem-
branes, on the smooth surface of the membrane, are, in the
female especially, particularly frequent.

We find on the attached surface of the peritoneum all
those forms of inflammation which are observed on the
attached surface of the other serous membranes. The ap-
pearance of œdema beneath the peritoneum is probably
less often the result of inflammation, than of a more purely
hydropic tendency, induced by disease of the lungs, heart,
liver, or kidneys. By whatever cause induced, it is neces-
sarily most distinct in those situations in which the cellular
tissue is loose and abundant: hence it is often copious
about the kidneys and the pancreas, the lobules of which it
sometimes separates. It not unfrequently adds a consi-
derable thickness to the parietes of the gall-bladder; and
when this is the case, the lymphatics of this viscus are often

Œdema of sub-perito-neal cellular tissue.

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beautifully distinct and turgid. In the intestines, though
these are often the subject of œdema, the effusion is gene-
rally separated from the serous membrane by the muscular
coat; between which and the mucous membrane, its pre-
sence often forms a remarkable phænomenon, which will
with more propriety be treated of in conjunction with the
gastro-intestinal lining. Although the peritoneum appears
to be very intimately united to the uterus in its unimpreg-
nated state, yet, even behind this portion of the peri-
toneum, œdema is sometimes to be met with.

Formation of vesicles beneath the peritoneum.

Circumscribed serous effusions of a remarkable character
are not very unfrequently met with about the ovaries,
Fallopian tubes, and broad ligaments. On the ovaries, they
sometimes assume the form of minute transparent vesicles,
evidently situated between the peritoneum and the fibrous
coat of the organ. We find them varying in size, from
that of a millet-seed to that of a pea or marble. Magendie
has mentioned similar vesicles observable on the ovaries of
bitches, shortly after impregnation; and hence, though we
are scarcely warranted in regarding them as strictly the
result of inflammation, it seems probable that they owe their
origin to a degree of irritation bordering on this state.
Another description of sub-peritoneal vesicles of a more
permanent nature, and most probably of congenital forma-
tion, is more frequently met with attached near to these
organs. They consist of vesicles, generally of about the
size of a pea, having firmer and more evidently vascular
coats than those which I last described; and attached by
slender peduncles, often of one, and sometimes of two inches
in length. They are found on the fimbriated extremities of
the Fallopian tubes, as well as on the ovaries. We meet with
them in young subjects, as well as in those advanced in
years; and though abnormal, they can scarcely be regarded
as morbid appearances. I enumerate them rather for the
sake of hereafter pointing out the distinction which must
be drawn between such cysts, and others which at times

affect these organs, than for the sake of their own intrinsic importance.

The circumscribed collections of serum, which are formed between the folds of the broad ligaments, often attain to a much larger size, equalling in volume an egg or an orange; and I think it extremely probable that they may at times acquire a size sufficient to produce large abdominal tumors, and to constitute one of the forms of encysted dropsy which have been erroneously considered as ovarian. When of moderate size, these cysts or collections of serous fluid beneath the peritoneum forming the broad ligaments might easily be mistaken for collections formed within the obstructed Fallopian tube; but, by laying the tube open, or filling it with mercury or some other fluid, its want of connection with the sac containing the fluid may be demonstrated. When the cysts are of such large size as to incur the chance of being mistaken for a disease of the ovary itself, we may sometimes be set right, by discovering this organ with its structure unaltered, or by the solitary character of the cyst, which does not present that remarkable and highly interesting feature of the other and more frequently ovarian form of encysted dropsy—the formation of secondary cysts.

Serous cysts in broad ligaments.

When, in the place of serum, and as a direct consequence of inflammation, we have the effusion of a less aqueous material, this may either be of the plastic, or of the inorganizable kind. The former is the least frequent, if we except its partial and very limited occurrence beneath those portions of the peritoneum which invest the liver and the spleen, or where tumors are developed beneath the peritoneum; such as, hydatids and extra-uterine fœtuses. I have seen one instance of such deposit, to a considerable extent, in the sub-serous membrane covering the urinary bladder. When at all abundant, it is extremely prone to assume a dense and semicartilaginous structure; and has a considerable tendency to acquire a bony or

Effects of inflammation on the attached surface.

Plastic effusion.

earthy character, in conformity with the general remarks which I offered in speaking of the morbid changes which take place on the attached surface of the serous membranes. Examples of the appearance which I have been describing, may be found in cartilaginous and bony patches on the spleen; beneath hernial sacs; and more particularly, beneath such portions of peritoneum as may cover any of the forms of tumor of which the abdominal cavity is liable to become the seat. For example, irregular plates of cartilage, or bone, are very apt to be formed in the parietes of those cysts, which envelope either a family of acephalocyst hydatids, or a chronic ovarian tumor, such as those which contain fat, hair, and teeth.

Non-plastic effusion.

The inorganizable deposits are found either in the form of circumscribed purulent collections which at times occur in conjunction with a plastic effusion, which has produced bridles and membranes on the polished surface ; or in the form of a more or less concrete puriform layer without defined limits, and diffused through the sub-serous cellular membrane which it infiltrates. I have found this form both in the mesentery and under the peritoneal coat of the intestines, in cases in which the inflammation appeared to have been occasioned by a local rather than a constitutional cause ; and, in conjunction with this, there has been, on the polished surface, an effusion which held a middle character between the plastic and inorganizable form. Whilst I state these as facts which appeared to be worthy of observation, in the cases which have fallen under my notice, I am far from asserting that they are essential concomitants of that particular state of the sub-serous cellular membrane of which I have been speaking.

Lacerability of the sub-serous cellular tissue from sero-purulent infiltration.

There is another state which inflammation produces on the unattached surface of the peritoneum, which is particularly worthy of attention ; and is more closely allied to the cases last mentioned, than to those which are accompanied with the plastic or organizable deposit. The attachment of

the peritoneum to the parts over which it is spread, becomes of the weakest possible description, from the soft and lacerable state of the intervening cellular membrane, which we find infiltrated with a thin and dingy sero-purulent fluid. This fluid is, in some situations, more or less tinged with blood.

This state of the peritoneum is found affecting a much larger extent than that which I last considered, but, like it, is restrained by no defined limits. The situation in which it is by far the most frequently met with, is the pelvis; where its production is most probably favoured, not only by the quantity and character of the cellular membrane, but by the position of the parts, and the nature of the viscera, over which this portion of the peritoneum is extended. Such is the facility with which, in this state of the attached surface of the peritoneum, the pelvic viscera may be separated from their serous covering, that the scalpel is scarcely wanted for their removal, and the finger finds almost no resistance in passing through them. In most, if not in all the cases in which I have met with this disorganization, it concurred with a soiled and highly puriform secretion, diffused, in a moderate quantity, over the smooth surface of the peritoneum. In a large majority, it concurred with, and appeared to depend upon, disease of, or injury done to, some of the pelvic viscera, or parts in their immediate neighbourhood. Thus I have met with it in puerperal peritonitis, in the peritonitis which had succeeded to stricture, or disease of the bladder, and in persons who have died after lithotomy, extravasation of urine, or fracture of the pelvis.

The extremely lacerable state of the subserous cellular membrane, facilitating the separation of the parts between which it is interposed, is not only the result of a high degree of acute inflammation, as in the cases which I have been describing, but is also met with in a somewhat different, though no less remarkable form, in conjunction with chronic peritonitis. We find it, both when this form of inflammation

Lacerability of sub-mucous cellular tissue concurrent with that of sub-serous, in some forms of chronic peritonitis.

is accompanied with a very copious serous effusion, and
also when there is little or no fluid in the abdomen, and the
intestines are inextricably matted together by universal
adhesions.   In these cases, the lacerability of the cellular
structure is not confined to that which unites the peritoneal
to the muscular coat of the intestines, but extends to that
which is situated between the muscular and the mucous.
Indeed, it is, in general, much more strikingly evident here
than in the more immediately sub-serous cellular mem-
brane; a circumstance, which, though in part ascribable to
the greater abundance of the sub-mucous tissue, is probably
in a greater measure owing to the superior firmness of the
mucous coat, which renders its separation at once more easy
and more conspicuous.   When this state exists in a very
marked degree, several feet of mucous membrane may be
drawn out, almost without any effort.   This remarkable
phænomenon, though noticed by one or more of the older
morbid anatomists, has been, very generally, either over-
looked or neglected.   I am not aware that even Dr. Baillie
has made any allusion to it; and it was not until I had
myself collected several examples, that I learned that Dr.
Barron had noticed the ready separation of the coats of the
intestines in that form of disease, which, notwithstanding
the Doctor's opinion, I cannot help regarding as a chronic
inflammation of the peritoneum.   He has both described
this ready separation, as seen in one case by himself; and
has quoted an example from the writings of De Haen.   Both
of these authors describe the separation as principally, if not
solely, taking place between the serous and the other coats.
The cases which I have myself seen, left no room to doubt
the more ready separation of the *mucous* membrane.   In all
these cases, there was a paleness and want of cohesion in
the muscular coat, the fibres of which were very distinct.
The following remarkable case, in which I first noticed this
phænomenon, will tend to explain it more clearly.

Case.   Elizabeth Sayce, aged 20, was a patient of Dr. Bright, in

Charity Ward. She had laboured under protracted symptoms of fever, with frequent vomiting, and obstinate constipation. The inspection was made on the 8th of 6th month (June) 1826. The head was not opened. The pleuræ were nearly if not quite free from adhesions; but there were some traces of inflammation on the right side, where there was an evident deposit of coagulable matter. There was no notable quantity of fluid on either side. The lungs readily collapsed on the opening of the chest. They were of a light colour, free from black pulmonary matter, and, with the exception of a little cadaveric infiltration posteriorly, they were generally of a pale red colour. There were a few small defined tubercles, varying in size from that of a millet-seed to that of a small pea, quite in an incipient state, firm and crude. The texture of the lung in their immediate vicinity was light and crepitant, and appeared to have undergone no change.

The heart was of moderate size, and healthy.

The parietes of the abdomen were generally and firmly connected to the viscera, by a thick, but rather soft adventitious membrane, loaded with minute cheesy scrofulous tubercles of a light yellow colour; whilst the small intervening spaces were, for the most part, of a dark venous hue, but, in some spots, of a brighter colour. This was particularly the case about the hypogastric region, where the adventitious membrane formed two distinct layers; the one lining the parietes, the other covering and connecting the intestines. They had smooth and apparently secreting surfaces, by which they were applied to each other; and which, in addition to the bright red tinge before mentioned, presented additional traces of recent inflammation in some soft coagulable matter, forming tender fibrinous adhesions. There was no trace of omentum distinguishable from the before-mentioned adventitious matter; which dipped in between the convolutions of the intestines and the different viscera, uniting them inextricably together. The tubercles

were not nearly so numerous in that part of the adventitious membrane which dipped in between the viscera, as in those portions which were stretched over them, and lined the parietes. Extensive and intricate adhesions rendered it impossible to distinguish the mesentery. The glands did not appear to be remarkably large, or to be loaded with tuberculous matter, from which the posterior part of the abdomen was nearly exempt.

The stomach was small. Its lining membrane was of a deep red towards its cardiac extremity; but the middle, and the pyloric extremity, were of a pale dusky hue. In attempting to separate the convolutions of the intestines, the adventitious matter which united them, and also the muscular and peritoneal coats, gave way, and were torn through; leaving entire the mucous coat, which adhered so slightly to the muscular, that several feet of it could be withdrawn without the slightest difficulty. This was the case in the large, as well as in the small intestines. The muscular coat was thin and pale; and, though tender and lacerable, its fibres were distinctly visible. The mucous coat was of a pale leaden hue; but little thickened, and in general pretty firm; though some parts were easily lacerated. The intestines, but more particularly the large, contained somewhat hardened fæculent matter, of a pretty uniform turmeric yellow colour. The liver was remarkably pale, and the gall-bladder nearly empty. The structure of the spleen was quite healthy; but it was readily torn away from its proper tunic, which was held by adhesions contracted with the surrounding parts. The pancreas and kidneys were healthy. The uterus and its appendages were covered by adventitious membrane, thickened by tuberculous matter. The right ovary was enlarged by a deposition of the same substance.

Matting together of intestines concomitant with this lacerability.

The remarkable degree of lacerability of the sub-serous and sub-mucous cellular structure of the intestines, in the case which I have just detailed, was concurrent with an equally remarkable adhesion between the convolutions of

the intestines. A similar, but somewhat less considerable
adhesion between the intestines, occurred not only in most
of the cases which I have since seen, but also in that which
Dr. Barron has quoted from De Haen. The coincidence,
however, is not universal; and, as I have already said, the
state of the sub-serous cellular membrane which I have been
describing accompanies some cases of ascites from chronic
peritonitis. In a case of this kind, I have found it in con-
junction with a considerable degree of shortening of the
mesentery. A very similar case occurred, not long since,
to my friend Dr. Stroud. The separation of the mucous
coat was, in this instance, most remarkable in the appendix
cæci; and very completely exposed the muscular fibres of
this part.

We may now proceed to the consideration of the hetero-
logue deposits which are met with on the attached surface
of the peritoneum. Of these, scofulous tubercles and tu-
mors are not only the most frequent, but are also the most
nearly related to some of the affections of which we have
already spoken. They appear, indeed, to consist of the
inorganizable matter of inflammation, although no symptoms
of irritation or inflammation had been at all perceptible
during their formation. When well defined, they are seen
involved in a sort of tunic, or cyst, which appears to have
been formed from the surrounding cellular structure, some-
what condensed; and is of a character totally distinct from
that of the cysts which I shall hereafter describe to you as
forming the basis of many tumors of a supposed malignant
character. Sub-peritoneal scrofulous tumors are of the
largest size, and most frequent occurrence, between the folds
of the mesentery; but these, in most instances, belong ra-
ther to the derangements of the lymphatic glands, than
to those of the sub-serous tissue. Scrofulous tumors are
sometimes found in the omentum; and in this situation they
are said to attain to a considerable size. When they occur
beneath the peritoneal coat of the intestines, which is by no

Sub-perito-
neal hetero-
logue depo-
sits.—Scro-
fulous tu-
bercles.

means unfrequently the case, they are generally of small size, but very numerous; and, at times, give to the intestines the appearance of being sprinkled with particles of boiled rice. These little tubercles are often surrounded by a vascular areola, which sometimes acquires a dark colour, from a change of the blood within the vessels. When very minute, and meriting the appellation of miliary, they appear to be situated between the layers, into which the serous membrane itself, notwithstanding its tenuity, may sometimes be split. I have seen this fact clearly demonstrated by my friend Dr. Hughes.

Malignant growths.

The next form of deposit of which I shall speak, comprises those of a cancerous or malignant nature; which, like tumors of the same description in other situations, are known by the names of scirrhous, fungoid, melanoid, &c. In some cases, they appear to have originally and primarily invaded the attached surface of the peritoneum; whilst in others, the disease, having attacked a different tissue, is at length propagated to this. In the former case, the tumors are often remarkable for their size, number, and diffusion. Yet, even in these cases, some portions of the peritoneum more frequently escape than others. Thus, the morbid growths are not so often met with on the parietes, as in the omentum, or in the intestines; and when found in the parietes, they are generally of smaller size. Neither the mesenteric glands, nor the other organs invested by the peritoneum, are apt to become affected by the extension of the disease; but its relation to the serous membrane is occasionally evinced by its appearance in the pleura. They are sometimes, although not necessarily, accompanied by an effusion into the peritoneal cavity; and the ascitic distension, to which they thus give rise, is, now and then, very considerable. When the disease is propagated from another organ already affected, it is generally, but not invariably, limited to the neighbourhood of the part from which it is derived: thus, in a case of scirrhus of the pylorus, we may

find a sprinkling of minute scirrhous tubercles under the peritoneum, in the neighbourhood. A similar remark will apply to cases of malignant tubercles in the liver: and in malignant disease of the uterus, the convolutions of intestine, which happen to come in contact with it, will exhibit growths of a corresponding character beneath their peritoneal coat.

I shall not anticipate the remarks which I hereafter shall have to offer respecting the formation and structure of these heterologue formations; but before I leave this subject, I will detail a case in which I have met with the affections now under consideration in a very characteristic form.

Martha Doherty, a patient of Dr. Bright, aged 40, died in Charity Ward after the fourth repetition of paracentesis. The body was inspected on the 3d of 2d month (February), 1826.

Case of malignant disease of peritoneum.

Head not examined.

Thorax.—The pleura was free from adhesion, and everywhere healthy; except that several small, rounded, fungoid bodies, of a bright-red colour, and scarcely so large as wild cherries, grew from it, on the left side; forming two rows of four or five inches in length, immediately subjacent to the under edges of two contiguous ribs. The lungs were crepitant, and perfectly healthy; except that near the edge of one of the lobes were a few rounded, shot-like bodies, of a black colour throughout. There was no morbid appearance in the heart.

Abdomen.—Notwithstanding the recent operation of paracentesis, this cavity contained several quarts of fluid. The peritoneum investing the parietes was much thickened, of an uneven surface, and offered a few small fungoid granulations. The viscera were almost entirely concealed under the load of fungoid or encephaloid tumors, growing from their thickened and disorganized peritoneal coat. These tumors were of a rounded figure, varying in size from that of a pea to that of an egg. Some were adherent by merely a

slender peduncle. Many were contiguous, running into
each other. The omentum was converted into a mass of
this kind, and retained no trace of its original structure.
For the most part, these tumors were of a white colour,
mottled with spots of a venous hue; but the smaller ones
had a bright-red, highly vascular, and tender, membranous
covering. When cut into, they exhibited considerable
variety, both as to colour and consistence. They chiefly
contained a substance of a pearly-white colour, soft in all,
but in some quite grumous. In the smaller tumors this
matter was penetrated by minute florid vessels. In the
larger it was more unmixed; though some of these contained
cysts filled with a dark bloody or chocolate-coloured fluid,
and a few a small quantity of pale transparent fluid. Over
the liver and spleen, the accidental tissue was of a firmer
structure, of a more dead white, and deposited in the form
of a layer of some thickness. The structure of both these
organs was unaltered, except that the liver was too soft.
The bile appeared to be natural. The pancreas was healthy.

The mucous membrane of the stomach, near to the car-
diac extremity, exhibited a considerable extent of darkish
ecchymosis. No disease was discoverable at the pylorus, or
any other part of the stomach; though this organ may be
regarded as favourable to the growth of encephaloid matter.
The mucous membrane of the rest of the canal inclined to
a leaden hue, without any other morbid appearance. The
mesentery was thickened, but nearly or quite free from the
cerebriform matter. Its layers were readily separated; and
the absorbent glands were very little, if at all altered in size
or structure.

The whole urinary apparatus, kidneys, ureters, and blad-
der, were exempt from disease; yet it is difficult to con-
ceive that the numerous tumors in the immediate vicinity of
the bladder could have permitted the retention of more
than a small quantity of urine.

The uterus, with its appendages, was completely im-

bedded in the adventitious growth. It was small, and its cavity healthy. The Fallopian tubes, though not recogni- zable externally, were still pervious; but no trace of the fimbriated extremity could be made out. One of the ovaria was found completely imbedded in the diseased growth: it was small: a part of the organ, which appeared to have been the seat of a corpus luteum, was soft, and rea- dily broken down; and a small cyst, containing dark gru- mous matter, appeared to be connected with it. The rest of the ovary retained its natural structure. The other ovary was so far implicated in the disease as to escape de- tection. The adventitious structure in the neighbourhood of both ovaries had a more dense and cartilaginous struc- ture than elsewhere; and contained several cysts, filled with a dark thick fluid.

True hydatids, and those more especially of the species Hydatid growths beneath the peritoneum. Acephalocystis, are occasionally developed beneath the peri- toneum in different parts of the abdomen, and sometimes give rise to tumors of enormous size. Their most frequent seat appears to be beneath the peritoneal covering of the liver; but they are at times met with in other parts, more especially under the peritoneal covering of the spleen, in the mesentery, and between the folds of the broad liga- ments. In this latter situation, they constitute a form of encysted dropsy, which it is nearly or quite impossible to distinguish, during life, from genuine ovarian dropsy. The appearances discoverable after death have likewise been confounded, although the characters of the two affections are essentially distinct.

TUNICA VAGINALIS.

We shall now quit the peritoneum, and say a few words Tunica vaginalis. respecting its offset, the tunica vaginalis testis. Like the pericardium, the tunica vaginalis presents one of the simplest specimens of a serous or reflected membrane. Naturally absent during the greater portion of the fœtal life, its defi- ciency sometimes continues nearly to the time of puberty,

or even beyond that period. It more frequently happens, that though the testis has descended into the scrotum, its serous covering continues to form a process of peritoneum, instead of acquiring a distinct existence.

Distension of tunica vaginalis.

The tunica vaginalis is susceptible of very great distension, both from those diseases which augment the volume of the testicle, and from those causes which distend the cavity of the membrane itself; such as, hydrocele, hæmatocele, and congenital hernia.

Results of inflammation.

The polished surface of the tunica vaginalis sometimes becomes the seat of inflammation; and the membranous bands and bridles which are found uniting its opposed surfaces evince that this effusion has been of the plastic kind. The fact, however, is rendered most completely evident in those cases in which the inflammation of the tunica vaginalis has been purposely excited by art, for the radical cure of hydrocele. I have seen an opaque layer of tender recent false membrane, in which there was an evident admixture of inorganizable matter formed in the tunica vaginalis, which had been punctured in a case of diseased testicle. The tunica vaginalis is sometimes prodigiously thickened by semicartilaginous layers, the result of chronic inflammation in cases of long-standing hydrocele. Loose concretions, of a spherical figure and of about the size of a pea, similar to those which I have described as being met with in the cavities of the pleura and peritoneum, are also found within the serous covering of the testis.

Hydrocele.

Hydrocele, or an accumulation of serous effusion in its cavity, is the most frequent morbid affection to which this membrane is liable. It is probably sometimes of a tonic, and at others of an atonic character; yet, even when belonging to the former class, it appears to depend on an irritation of so slight a nature, as scarcely to merit the name of inflammation. The fluid, though charged with albumen, is rarely mixed with flakes of coagula, but, at times, deposits a very minute quantity of opaque ochry substance.

I have found the free surface of the tunica vaginalis

roughened by minute elevations, as if from a sprinkling of fine sand. This state may be regarded as an instance of that form of inflammation of a serous membrane in which the product is scabrous.

Sanguinolent and sanguineous effusions are met with in the tunica vaginalis, and constitute the disease called Hæmatocele. Sometimes they proceed from the manifest rupture of vessels; and at others, appear to be the result of transudation. *Hæmato-cele.*

On the attached surface of the tunica vaginalis we find a good specimen of the inflammatory œdematous effusion. We see it in hernia humoralis, and in the radical cure of hydrocele. The close portion of the tunica vaginalis, or a false membrane formed upon it, may sometimes be raised by partial collections of serum in the form of vesicles or blebs. The tunica vaginalis also affords examples of small vascular cysts, attached by long and slender peduncles, bearing the closest resemblance to those which we have described, formed by the peritoneum in the neighbourhood of the ovaries. A body of this kind has, I believe, been mistaken for a third testicle. These cysts are not to be regarded as morbid; but it is proper to bear them in recollection, since it may enable us to satisfy a patient's mind respecting them. The inflammatory deposits on the attached surface of the tunica vaginalis, like those beneath the other serous membranes, are liable to conversion into bone. *Attached surface of the tunica vaginalis.*

The heterologue deposits which are formed beneath the tunica vaginalis, whether scrofulous or malignant, generally, if not invariably, belong rather to the testicle, than to its serous membrane. Hydatids have been said to affect the tunica vaginalis. In the only instance in which I have seen true hydatids within the scrotum, I was not able to say whether they belonged to the testicle itself, or to the tunica vaginalis. *Heterologue deposits beneath the tunica vaginalis.*

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SYNOVIAL MEMBRANES.

Synovial capsules.

Before I quit the serous membranes, I must say a few words respecting the synovial capsules. The most important of these are met with in the joints, where they are so intimately connected with other tissues, as the fibrous, the fibro-cartilaginous, and the bony, that the consideration of their derangements cannot, with propriety, be taken up at present. They exist more simply in the bursæ

Bursæ mucosæ, and sheaths of tendons.

mucosæ, and in the sheaths of tendons. Their deviations from the normal state, dependent on deficiency or excess, are of no great interest. The bursæ admit of considerable variety; and may be produced accidentally, in some parts, by pressure and friction. Their secretion, the synovia, which exhibits the transition from serum to mucus, appears to be designed by nature to afford an obstacle to the production of adhesions, as well as to facilitate motion. Adhesions, however, may occasionally be met with.

Loose bodies within the capsules.

These membranes are more liable than the more perfect serous membranes to the production of loose bodies which may assume the form of cartilage. The detached state of these bodies may, I conceive, in part be attributed to the obstacles which even the plastic form of inflammation must find to the formation of adhesions. Great numbers of these loose bodies are occasionally found in the synovial sheath of the tendons of the wrist. I have seen them of the form and size of melon-seeds; and, in this case, they readily changed their position on pressure, passing freely from the wrist to the palm, and back again, beneath the ligamentum carpi annulare. The most violent constitutional irritation followed a puncture for their removal. Dupuytren has advanced the idea of their being hydatid formations; but I think them more satisfactorily accounted for, by the analogy which I have pointed out. Arthropuosis is an instance of the non-plastic product of inflammation of a synovial membrane; and the thickening about the bursæ and the sheaths of tendons, of the effect of inflammation on the attached

surface. The product may be bony; as is sometimes seen in the horse.

The most frequent morbid change to which these cavities are liable, is the accumulation of their secretion. This is occasionally a solitary and chronic affection, constituting ganglion; but it is much more frequently acute, more or less general, and dependent on a constitutional state, which may be called the rheumatic diathesis. When this exists, it sometimes brings into view the sympathetic relation which subsists between these membranes and the more perfectly serous: thus, we find pericarditis, pleuritis, peritonitis, and hydrocele, conjoined to, or alternating with, the rheumatic inflammation of the joints, thecæ, and bursæ.

In the chronic affection of the bursæ, constituting ganglion, we sometimes find granular elevations, and filamentous projections from their internal surface; and I have seen similar productions on the internal surface of an adventitious synovial capsule about the extremities of a broken bone, in a case of un-united fracture of the arm.

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LECTURE VII.

ON PARASITIC ANIMALS.

REASONS FOR THE PRESENT DIGRESSION.—COMMON ERROR OF CONFOUNDING
HYDATIDS WITH ADVENTITIOUS SEROUS CYSTS.—ORDERS OF PARASITIC ANI-
MALS—THE ENTOZOA—DIVISION OF ENTOZOA INTO THREE CLASSES: 1. THE
VESICULAR WORMS OR HYDATIDS—VITALITY OF HYDATIDS—CLASSIFICATION
OF HYDATIDS—CYSTICERCUS IN MAN AND THE LOWER ANIMALS—THE POLY-
CEPHALUS, DICERAS, AND ECHINOCOCCUS—THE ACEPHALOCYSTIS—STRUC-
TURE OF THE ACEPHALOCYSTS—GENERATION OF THE ACEPHALOCYST—
VARIATIONS FROM ORDINARY STRUCTURE—DEATH OF ACEPHALOCYSTS—
CASE ILLUSTRATIVE OF THE ACCOUNT GIVEN OF THIS ANIMAL—SPONTA-
NEOUS CURE OF HYDATIDS — THERAPEUTIC INDICATIONS. — 2. THE FLAT
WORMS — DESCRIPTION OF DIFFERENT CLASSES OF FLAT WORMS, THE
BOTHRIOCEPHALUS LATUS, TÆNIA SOLIUM, FASCIOLA OR DISTOMA, &c.—
3. THE CYLINDRICAL WORMS, OR ENTOZOA NEMATOIDEA — THE GENERAL
CHARACTERS OF THESE WORMS — REMARKS ON THE ASCARIDES LUMBRI-
COIDES—SYMPTOMS OF THE PRESENCE OF THESE WORMS—STATE OF THE
INTESTINE IN WHICH THEY OCCUR — THE OXYURIS VERMICULARIS, ITS
CHARACTERS, SEAT, AND PROPAGATION—THE TRICHOCEPHALUS—FILARIÆ
— STRONGYLUS GIGAS — TRICHINA SPIRALIS, &c. — BRIEF COMMENTS ON
PARASITIC INSECTS — THE PEDICULUS—THE PULEX — THE ACARUS — THE
ŒSTRI—THE CUTEREBRA—DISCUSSION OF THE QUESTION, HOW DO PARA-
SITIC ANIMALS ENTER THE SYSTEM?—CONNECTING LINK FORMED BY THIS
SUBJECT BETWEEN PATHOLOGY AND NATURAL HISTORY.

GENTLEMEN,

In my last Lecture, I terminated my observations on the
Morbid Anatomy of the normal Serous Membranes. The
natural order of procedure would be, to advance next to
the consideration of those serous membranes which are
the result of accidental production, and are occasionally
found in different parts of the body, but most frequently in
the neighbourhood of the ovaries and uterus. They con-
sist of what are termed serous cysts; and are not only in-
teresting in themselves, but worthy of very careful attention,
as elucidating the transition from the serous to the mucous
membranes, and as affording a key to the formation and

Adventi-
tious serous
cysts.

developement of several of the heterologue structures which constitute some of the most fatal and intractable affections to which the human frame is liable.   Prior, however, to a description of the phænomena presented by these adventitious formations, a digression of some length will be necessary, in order to remove a common error in pathology. These cysts are frequently confounded with one of the species of true hydatid, the acephalocystis; which, from its total want of continuity with the organ in which it is developed, and from its mode of propagation, is reasonably regarded as a parasitical animal.   The description of the various appearances presented by hydatids, and of the morbid changes which they induce in the parts in which they exist, may therefore be regarded as an almost necessary prelude to the consideration of those adventitious cysts to which I have alluded ; and the connection between hydatids and other parasitical animals may, I think, afford a sufficient plea for the digression which I shall make, in introducing to your notice some other members of this class.

Reasons for the prior consideration of hydatids and other parasitic animals.

It is not my purpose to trouble you with a zoological synopsis and description of all parasitical animals.   When it is recollected, that the mammalia, birds, fishes, reptiles, and even the mollusca, are preyed upon by other animals, which, consequently, must be classed with those now under consideration, it is obvious that they might be made the subject of several distinct Lectures ; but this would be foreign to the subject of morbid anatomy, and would be admissible only in a zoological course.   I shall present you, briefly, with such a classification as will facilitate the description of the parasitical animals which infest man : and if I incidentally notice a few which are found in other animals, it will be either for the sake of illustrating the subject, or because of some particular interest they may possess.

Of parasitical animals, some classes are found imbedded in the substance of, or lodged in, internal cavities ; and are never, or, at most, but rarely and accidentally, met with out of

Orders of parasitic animals.

the body. They constitute the intestinal animals of Cuvier, and the entozoa of Rudolphi. Other parasitical animals support a more distinct life, and have recourse to the animal which they infest only for their supply of food, and for the deposition of their eggs or larvæ. It is for a part only of their lives that they are imbedded in, or attached to, the animal, at whose expense they subsist. The greater number of these belong to the active class of insects; but a few, as, for example, the leech, are found amongst the annelides mollusca.

Entozoa—
where
found.

The entozoa first claim our attention. These, as I have already remarked, can live, and propagate their species, only in the interior of other animals. They are found, not only in the alimentary canal, and in the passages which open into it, but also in the cellular tissue, in the muscles, and in the substance of organs the most inaccessible from the surface of the body; as, for example, in the brain. There is scarcely any animal which is not infested by several species of the entozoa; and it is rare for the same species to be found in more than one, or, at most, in more than a very

How are
entozoa
produced ?

few species of other animals. The difficulty of explaining in what manner they enter the system, added to the observation that they are not met with out of the body, has induced some naturalists to conclude that they are spontaneously produced. It is certain, however, not only that the greater number bring forth either visible eggs, or living young ones, but that many of them present the sexes distinct, and copulate like other animals. Hence, it is more generally believed that they are propagated by germs sufficiently minute to be conveyed through the smallest passages, or that these germs may be introduced into young animals before birth.

Organiza-
tion of
entozoa.

The entozoa, or intestinal animals, are not possessed of any distinct and visible organ of respiration: they must therefore receive the influence of oxygen through the medium of the animals which they inhabit. No trace of a circula-

ting system has been discovered in them; and the indications of nerves are, even in the most perfect of them, so obscure, that their existence has been doubted. In other respects, they present great varieties in their organization.

The entozoa found in man have been arranged under three heads: 1. The vesicular worms. 2. Flat worms. 3. Cylindrical worms. The two first, or the vesicular, and the flat, belong to Cuvier's order of parenchymatous intestinal animals, or those whose imperfect viscera penetrate and ramify through their substance, and those in which not even a trace of alimentary canal can be perceived. The cylindrical worms, on the other hand, are included in Cuvier's order of cavitaires; or those which have an intestinal canal, furnished with a mouth and anus, and floating in a distinct abdominal cavity. *Classification of entozoa.*

1. OF VESICULAR WORMS OR HYDATIDS.

The vesicular worms are possessed of a caudal bladder or vesicle, which constitutes the greater part of the animal, and on which the name of the order depends. It is of a greater or smaller size; and is either proper to one individual, or common to several. In one genus, the acephalocystis, the animal consists of nothing but this bladder. Others possess a body, which is always very small in proportion to the animal, and a head bearing some resemblance to that of the tænia, and variously armed with tentacula and sucking orifices.

Though vesicular worms, or hydatids, as they are more commonly called in this country, are not of very frequent occurrence in man, yet they are by no means rare. The cases on record shew, that there is no texture or organ of the body in which they have not been found. By their developement in the heart, the lungs, the brain, or spinal marrow, they have immediately interfered with the most essential functions of life. When taking their origin in less-important organs, their progressive growth, and prodigious *Presence of hydatids in man, and their effects.*

power of multiplication, may occasion the formation of tumors of the largest size; which, by displacing or causing the absorption of the neighbouring parts, destroy life with almost equal certainty, though more indirectly. No period of life is exempt from them. Portal mentions an instance of their having been found in the fœtus. They are met with in a great many of the mammalia; and it would appear that the cold-blooded animals are not free from them. There is no little confusion in the descriptions which authors have given of them, in consequence of a sufficiently careful distinction not having been made between true hydatids and other cysts, which, though they bear considerable resem-

Distinct vitality of hydatids.

blance to them, are, essentially, very different. Respecting the nature of these cysts there is a great difference of opinion. Some naturalists regard them all as possessing a distinct vitality, although of the very lowest order; whilst others, supported by no less authority than that of Cuvier and Rudolphi, are willing to admit as animalcules only some of the more obviously organized vesicular worms. I confess that I am rather inclined to attach myself to the former opinion, and to follow the classification adopted by Cloquet, Portal, and Beclard. It is merely a modification of that of Rudolphi, and divides the *Entozoa Cystica*, or vesicular

Classification of hydatids.

worms, into five genera: 1. the *Cysticercus;* 2. the *Polycephalus;* 3. the *Diceras;* 4. the *Echinococcus;* and 5. the *Acephalocystis.* Some of these genera are either of rare occurrence, or are almost exclusively met with in the inferior animals; and, as I have not had the opportunity of carefully examining them for myself, I shall pass them over with very slight notice.

Cysticercus.

The cysticercus has a head somewhat resembling that of the tænia; and a nearly cylindrical body, terminated by a caudal vesicle. It generally exists singly in the cyst which contains it. It is more frequently met with in the inferior animals, than in man; and is by no means rare in the livers of sheep. In a specimen of human lungs with numerous

hydatids imbedded in them, which I believe was taken from
a subject some years since by Dr. Cholmeley, the hydatids
appear to be of this genus.   The largest of the cysticerci,
in this case, might have its caudal vesicle rather more than
one inch in diameter, with the neck nearly of the same
length. I have seen a cysticercus taken from the pia mater ;
but, in this instance, the caudal vesicle was scarcely larger
than a full-sized white currant.   I have also found a cysti-
cercus about the same size in the cellular membrane, ex-
ternal to the fascia, at the upper part of the thigh of a
female rather advanced in years.   My friend Dr. Sharpey
has informed me, that cysticerci are not very uncommon
in some parts of Germany ; or, at least, that he met with
them repeatedly whilst dissecting in Berlin.

The cysticerci of different animals differ considerably in
their form and proportion : those in man have, generally, the
neck about equal to the diameter of the vesicle, from which
it proceeds with a gradual diminution in size.   Some
cysticerci which I took from the abdomen of a small foreign
species of deer had about the same form and proportions as
those of man ; and the size was about the same.   Cysticerci
are not uncommon, and attain a large size, in sheep :
they are frequently found in the liver, and under the peri-
toneum forming the mesentery, in these animals.   A very
fatal and remarkable vertiginous affection, to which sheep
are liable, is found to depend on a species of cysticercus in
the brain.   This malady may be effectually relieved by the
use of the trephine. H. Smith of Southam, the philanthropic
advocate of self-supporting dispensaries, and other means
for benefitting the poor, has informed me, that he has often
performed this operation on the heads of sheep with great
success ; and he recommends it to the attention of young
surgeons in the country, not merely as an interesting sub-
ject, but as a means of acquiring dexterity in the use of the
instrument.   The large size of the cysticerci in the abdo-
men of sheep affords a good opportunity of examining their

*Cysticerci
in the lower
animals*

structure. The caudal vesicle does not appear to consist
of a perfectly smooth membrane, but presents an infinite
number of minute, closely-placed striæ, which appear to be
slightly elevated, and to have a direction nearly at right
angles to the axis of the animal. We also occasionally find
opaque white elevations upon some part of the caudal vesi-
cle. I suspect that they are a morbid appearance in the
animal. Cysticerci are said to be common in the pig; but I
do not remember that I have ever seen even a specimen of
them, and therefore I have nothing to observe respecting
them. I have seen small hydatids, which appeared to be
of this genus, in the muscular substance of the heart of the
bear. The cysticercus fasciolaris, which is found about the
livers of rats and mice, has a slender neck or body, at times
some inches in length. It is transversely striated, and the
caudal vesicle is extremely small: it might therefore be
mistaken for a tænia.

Envelope of
the cysti-
cerci.

The enclosing cyst in which the cysticerci are lodged,
whether derived from cellular membrane alone or from a
serous membrane in conjunction with the cellular, is gene-
rally thin; but when, in consequence of the death and con-
traction of the cysticercus, the enclosing cyst is allowed also
to contract, it may acquire considerable thickness, and a
dense structure. This is very conspicuous in the livers of
sheep, in which the whole sac sometimes acquires a bony
character. The death and contraction of the cysticercus
constitute the process by which a natural cure is effected.

Brief notice
of the poly-
cephalus,
diceras, and
echinococ-
cus.

The tame rabbit is at times infested with hydatids, occu-
pying the cellular membrane between the muscles. I be-
lieve these hydatids to be of the genus polycephalus. The
semi-transparent cyst which forms the principal part of the
hydatid presents, at several parts, opaque whitish spots of a
somewhat oval figure: they appear to project slightly on
the internal surface. Besides these bodies, there are some
minute transparent cysts of an irregular figure, having a
small attachment to the exterior of the principal sac. Of

the diceras and echinococcus I can say nothing, except that I suspect that some individuals of the genus acephalocystis, presenting numerous white opaque elevations on their surface, have been mistaken for the echinococcus.

The acephalocystis, a genus first established by Laennec, is that which is by far the most frequently found in man. Hydatids of this kind are enclosed in a cyst which is apparently derived from the cellular tissue of the surrounding parts; but acquires a dense and almost semicartilaginous structure, in which bony matter is sometimes deposited. This cyst, in some very rare cases, is said to have been absent. I have never seen an instance of the kind, and the assertion appears doubtful. *Genus acephalocystis.*

In a case in which a collection of large acephalocysts had formed under the peritoneal coat of the liver, I found the superficial absorbents greatly enlarged. Many were truncated laterally, and presented two openings into the sac. They were filled with a discoloured turbid fluid. The veins of the liver have been found laterally truncated, in the same manner, at the circumference of the enclosing cyst of an hydatid tumor.

The proper hydatid cysts, which have a lamellar structure, and in consistence bear a great resemblance to coagulated white of egg, have not the slightest connection with the enclosing cyst; and between them, there is generally a thin and unequal layer of a dirty, yellow, semiconcrete substance, which may possibly be an excrementitious secretion from the hydatid itself. The proper cyst is filled with a fluid; which, though generally clear and limpid, is sometimes turbid and discoloured. It is stated, by Dr. Baillie, to be coagulable by heat. Dr. Marcet says, that a very slight turbidity is produced; and that the fluid bears considerable resemblance to that of hydrocephalus, in the small quantity of animal matter which it contains. In an experiment which I made on the fluid of a very large hydatid found in the liver of a child seven years of age, *Structure of the true hydatid cysts.* *Character of the contained fluid.*

heat produced no change; and the result accords with the
experience of Cruveilhier.

It occasionally happens, that a solitary acephalocyst grows
to a large size, and contains only the fluid just described:
but more frequently we find, besides this fluid, smaller
cysts of a similar character; and these again may contain an
inferior order. The young hydatids appear to be pro-
duced from different parts of the parent cyst; to which they
are described, by authors, as being found attached, some-
times on the inside, and sometimes on the outside. For my
own part, I have never known an acephalocyst to produce
smaller ones, except from its internal surface; and to this I
have not seen them attached, except when of almost mi-
croscopic size. Whilst scarcely a few hundredths of an inch
in diameter, they may be seen in great numbers, perfectly
detached, in the fluid of the parent; and neither then, nor
when of larger size, have I been able to discover the least
trace of neck, or other attachment, to the superior cyst.
On the inner surface of the latter there are frequently seen
numerous elevations, variously disposed, and differing both in
form and magnitude, but generally minute. The opaque
white spots affecting the hydatid membrane are not con-
fined to the internal surface: they are occasionally found
upon the external surface. I have seen them half or two-
thirds of an inch in diameter, of a circular figure, with an
irregular surface, something like that of a cauliflower. It
is well to be acquainted with the appearance of these spots;
since it may happen that an hydatid tumor may be sponta-
neously evacuated by a communication with some part of
the alimentary canal, and the dead membranes may become
so much altered as to be scarcely recognizable whilst
coming away in fragments. Yet should one of these frag-
ments possess one or more of these elevations, it is so
characteristic, as to remove all doubt respecting the na-
ture of the case. These inequalities have been sup-
posed to depend on nascent hydatids: and the differences

New hyda-
tids gene-
rated by the
old.

Elevations
on the in-
ternal sur-
face of ace-
phalocysts.

which they present have been assumed to be the cha-
racteristics of three species of acephalocystis.   I am sa-
tisfied that many of these elevations are morbid growths
from the parent cyst; and others of them possibly point
out the spots whence the young have already been de-
tached.   I am not however prepared to affirm that none of
these elevations are attributable to nascent hydatids.   In
a case examined by Francis Sibson, jun. and myself, nu-
merous transparent spherical granules were seen in the
parietes of a parent hydatid acephalocyst : they were, in all
probability, nascent young ones, and appeared to throw
some light on the mode of production.   They were situated
much nearer to the internal than the external surface ;
and, although a few of them were of a larger size than some
of the small, perfectly-formed, detached hydatids which in
other cases I have seen within the interior of the parent,
in this instance there were none which had become de-
tached.   I imagine that the separation or retention of these *Causes*
little bodies may in some degree depend upon the nature of *which in-*
fluence the
the internal surface of the parent.   If this internal surface *detachment*
of young
be formed by an extremely thin membrane, or by a scarcely *hydatids.*
concrete substance, they may become detached almost as
soon as formed; but if the internal surface be composed of
a firm membrane, or some tenacious substance, they may
be retained, as in the instance last referred to, and even
acquire the semblance of a peduncular connection amongst
themselves or with the parent cyst.

The inferior or junior cysts, as well as the superior, have *Structure of*
acephalo-
a lamellar structure, present no uniform striæ, and are per- *cysts.*
fectly spherical.   I have, however, met with exceptions to
the two latter characteristics.   In a case of acephalocysts *Varieties.*
which occurred amongst my inspections, several of these
bodies, instead of presenting a spherical figure, exhibited a
sort of hour-glass contraction; by which, however, the ace-
phalocyst was not divided into two equal cavities, but, com-
monly, a small portion was imperfectly insulated.   In some

specimens, the contraction was slight; and in others, more
profound. It was very evident that this contraction de-
pended on the outer layer of which the laminated coat of
the acephalocyst was composed; since, on the removal of
this layer, the contraction disappeared. This peculiarity
was noticed in several of the acephalocysts found in one
subject; and I think I have met with the same appearance,
to a less degree, in other cases. The appearance which
I have next to notice, I have seen only on one occasion. A
very few of the acephalocysts, having rather more than an
inch in diameter, presented opaque white lines; which, after
taking a straight course, bifurcated once or twice, each
branch forming a similar angle with the line from which it
proceeded, and pursuing a direction forwards without form-
ing either curve or angle. I was unable to form any opi-
nion, whether these lines depended on a canal or not; nor
can I offer any conjecture respecting their nature.

Some of the secondary acephalocysts are slightly milky
or opaline: others are perfectly transparent, and capable of
answering completely the purpose of a lens. They occa-
sionally appear to have been produced at different times, or
to have advanced with different degrees of rapidity. By
the united effect of the growth of these cysts, the parent
cyst is finally burst, and dies.

Amongst a collection of hydatids, it is by no means uncom-
mon to find some which appear to have lost their vitality,
and to have become collapsed, more or less opaque, and of a
yellowish colour. These parasitical animals are supposed to
enjoy but a short period of life. The hydatids of pigs and
sheep are said to be produced in spring, and to die the fol-
lowing winter. It is certain, however, that in man, either
the continued life of individual hydatids, or a succession
of generations, will protract, not merely the existence, but
the growth of hydatid tumors to a much longer period.

The following case will not only confirm the remark
which I have just made, as to the length of time which

Length of
hydatid life.

hydatid tumors may exist, but will also afford some idea of
the size to which they may attain, and of the remarkable
changes which their slow but progressive growth is capable
of effecting in neighbouring parts.

Edward Culham, a man of about forty years of age, of a
pale and somewhat sallow complexion, had been ill for a
considerable time, and for about a year was a patient in this
hospital, under the care of Dr. Cholmeley. His abdomen
was distended to an extraordinary size, and was considerably
indurated, but free from fluctuation. It suggested an idea
of inequality, on the hand being passed over it. At the in-
spection of his body, an opening into the abdomen disco-
vered a large mass of nodulous tumors, of various sizes, and,
for the most part, of a light colour. Peritoneal adhesions,
together with a loose and vascular cellular web, connected
them into a firm unyielding mass, and produced an appear-
ance which was not inaptly compared to potatoes in a net.
The viscera were concealed, except some part of the liver,
and a few convolutions of small intestines pushed to the left
side, and shewing themselves between the tumors, which
proved to be formed by acephalocyst hydatids in various
stages of existence.

The chest was opened before the state of the abdomen
was disturbed. The diaphragm was pressed upwards, espe-
cially on the right side, so as to be about even with the
fourth or fifth rib. The lungs were healthy; and the
pleuræ, with the exception of one spot at the base of the left
lung, were free from adhesions. On the right side, an elon-
gated nodulous tumor, in consequence of either the absorp-
tion or the separation of the muscular fibres of the dia-
phragm, had made its way into the thorax, causing a projec-
tion of about three inches, tending directly upwards, over
which the pleura extended entire. At a corresponding part
on the left side, as before stated, there was a remarkably
strong adhesion of the lung to the diaphragm; which ap-
peared to depend on an extension of the disease from the

Case illustrative of preceding remarks, inspected 16th of 3d month (March) 1826.

abdomen, although on this side there was no tumor project-
ing into the thorax.

The chest having been examined, the contents of the
abdomen were removed; in doing which, several large hy-
datid cysts were unavoidably opened. With the exception
of the mesentery, no part appeared exempt from the invasion
of these parasitic animals. The liver was completely pene-
trated by them; though it did not appear that there were
any isolated and imbedded in its substance, which was soft,
and of rather a lighter colour than is usual. Of those which
had penetrated it from the surface, several had their contents
more or less tinged with bile. One large one, occupying
nearly the situation of the gall-bladder, was filled with dark
green bilious fluid, mixed with the broken cysts of smaller
hydatids. It was suspected that a cyst had communicated,
by ulceration, with the gall-bladder, but that viscus, and
both ducts, were subsequently found in a healthy state.
The spleen was much enlarged, and deeply penetrated by
an hydatid of large size. Several of the same kind sur-
rounded and concealed it. One of these was singular, from
being externally of a black colour; which was found to arise
from a thin layer of dark red blood interposed between
the enclosing cyst and the proper membrane of the hydatid.
The contained fluid was limpid, like that in the other cysts.
Two cysts, situated behind the stomach, made a conside-
rable projection into this organ, near to the pyloric extre-
mity; but the coats of the stomach were still sound. The
pancreas appeared healthy, as did also the structure of the
kidneys; but their figure was altered by compression, espe-
cially that of the right, which was much flattened and ex-
tended. They both contained numerous small lithic acid
calculi. The ureters were much enlarged, more particularly
the right. Hydatids of considerable size appeared com-
pletely to fill the pelvis; but the bladder was found healthy,
and even seemed to have admitted of a considerable degree
of distension. The mucous membrane of the intestines was

generally of a darkish colour, but presented nothing like ulceration. The whole abdomen appeared altogether void of fat.

The acephalocysts found in this case so completely agreed with the characters which I have already given, that it would be a useless repetition to describe them. Their number was very considerable, and several were of large size. When removed from the viscera, they filled more than half of a large pail. From the difference in their ages and sizes, they presented almost every possible variety, especially in the secondary order of hydatids. In some instances, they were so small, that the primary cyst appeared to contain nothing but a clear fluid, until a close inspection was made, when a multitude of minute vesicles were discovered, resembling grains of fine transparent sand. In other instances, the secondary formations bore a much larger proportion to the fluid in which they were contained, and varied from the smallest size to that of an egg, or even of a large orange; in which last case, they generally contained a third order. In other instances, again, the inferior cysts, instead of floating in the fluid of the parent, had appropriated the whole of it to themselves, assuming the appearance of a mass of grains, somewhat like the pulp of a pomegranate.

The circumstance, that acephalocysts are sometimes met with singly, though of large size, whilst in other instances they are very numerous, has led to the idea that this constitutes a specific character. The solitary species has been called the eremite, and the other the social hydatid. I confess that I doubt the propriety both of the division and of the name. I cannot imagine that the mere fact of an hydatid not containing a group of junior hydatids should distinguish it as a species from other hydatids, which it resembles in form and texture, but which contain a larger or smaller number of young ones. The term eremite signifies an inhabitant of a wilderness, and therefore can be little applicable to an hydatid.

Groundless distinction between eremite and social hydatids.

O

I am aware that I should be stepping out of my province, were I to digress into remarks of a therapeutical character; but so little is known as to the method of eradicating these animalcules, when they have gained possession, that I may be allowed to notice some indications as to treatment, which we may collect from an examination of the mode in which nature occasionally effects a spontaneous cure.

Process of nature in the spontaneous cure of hydatids.

This she does in two ways: 1st, By forming a communication between the cyst containing the hydatids, and either the surface of the body, or the intestinal canal, or some other cavity, as, for example, the urinary passages, by which they may be evacuated. Or, 2dly, the animal dies: its fluid is absorbed; and its membrane is folded and shut up, as an inert foreign body, within the outer cyst which contracts upon it. A complete instance of this process was seen in a case which I inspected some time after that which I have already related; and in which, the puckering of the surface of the liver was perfectly analogous to that of the surface of the lung after the extinction of a tuberculous cavity. It has been supposed by some, that nature employs the ossification of the enclosing cyst as the means of effecting the death of the hydatid, and of shutting it up as an extraneous body, when dead; but I am rather inclined to believe, that the deposition of bony matter seldom, if ever, takes place until the hydatid has either died, or become perfectly stationary as to growth. When hydatids are formed in the liver, it appears that nature often employs the bile as the means of procuring their death. This fact, which first attracted my attention in a third case which I inspected in this hospital, I find confirmed by subsequent cases, and by numerous scattered observations in which the circumstance has been stated merely incidentally. It does not appear that any one has noticed it as a general fact.

Remedial measures of art.

Cures might doubtless be obtained by art, in both of these modes. Several instances have occurred in which

hydatid tumors have been cured by means of incisions,
which have given exit to their contents; but, in other cases,
such incisions seem to have accelerated the fatal termination.
Dr. Seymour, in his work on the diseases of the ovaries, has
quoted from a case in which tapping was successfully em-
ployed for supposed ovarian dropsy. The history contained
ample internal evidence that this was really an instance of
hydatid tumor; and therefore probably lodged in the peri-
toneum forming the mesentery or folds of the broad liga-
ment. The extraction of the proper hydatid cyst, which
was of large size, and effected with some difficulty, was an
important element in the successful management of this
operation.

I have heard that some remarkable cases of abdominal
tumor dependent on hydatids have been successfully treated
by Dr. Recamier, one of the physicians at the Hôtel Dieu.
From symptoms, with which I am not acquainted, he was
induced very confidently to diagnose the existence of hy-
datids; and he steadily persevered in directing the re-
peated application of caustic, until the sac was opened, and
the acephalocysts allowed to escape. Hydatids have been
evacuated, and the patient cured, under the influence of
a saline purgative: and Laennec, having noticed that sheep
affected with vertigo dependent upon hydatids of the genus
cysticercus are cured by feeding in salt marshes, has been
led to recommend baths and fomentations containing a
solution of muriate of soda, in cases in which the pre-
sence of hydatids has been known or suspected. He sup-
ports his views by the detail of several successful cases; yet
the efficacy of this mode of treatment must so much de-
pend on cutaneous absorption and transudation through the
subjacent tissues, that, notwithstanding my veneration for
the author, I cannot but be sceptical with regard to it.
The diffusible nature and the anthelmintic virtues of tur-
pentine, and of Deppel's oil, might entitle them to a trial,
both internally and externally. It might also be made the

subject of experiment on inferior animals affected with hyda-
tids, how far the simple acu-puncture, or the more power-
ful electro-puncture, might succeed in procuring the death
of the hydatids, and the cure of the affected animals with-
out the expulsion of the cysts.

Of course, an operation for the evacuation of the contents
of a tumor dependent on hydatids can only be attempted
where the tumor is not of very large size, and where it is
likewise situated favourably for the operation. It is equally
obvious, that the death of the hydatids themselves will be
an event rather to be deprecated than desired, when, as in
the case of Culham, they are very numerous and widely
diffused.

Abscess oc-
casionally
follows the
death of
hydatids.

I have already observed to you, that hydatids have been
found in almost every tissue and every organ of the body.
As I shall have occasion to particularize such cases in treat-
ing of the different tissues, I shall not take up your time by
speaking of them at present. I believe that it sometimes,
though very rarely happens, when an acephalocyst hyda-
tid tumor has existed for a length of time, and passed
into an apparently quiescent state, after the death and con-
traction of the hydatid membranes, and when the enclosing
cyst of condensed cellular membrane has been converted
into a dense, feebly-organized, ligamentous structure, and
even become loaded with earthy matter, that, its connec-
tion with the surrounding natural tissues being by some
cause or other materially injured, inflammation and soften-
ing succeed in the adjacent structure, and so may give
rise to a species of abscess. Two cases which have come
under my notice, proved of an indolent and chronic cha-
racter, and brought the patient to his grave. On examina-
tion, a cavity was found in the liver, containing much
soiled and offensive pus, mixed with the remains of the
enclosing cyst, completely detached, and forming a large
ragged shred of condensed cellular membrane. In one of
these cases, the detached cyst contained much bony matter,

and was deeply stained with bile. The hydatid membranes themselves had completely disappeared. Both of these instances occurred in the liver; and I am not aware of similar phænomena taking place in any other organ.

2. OF FLAT WORMS.

These worms have soft bodies more or less compressed, and heads furnished with two or more sucking pores, which in some are armed with points, but in others are naked. They have no abdominal cavity; and their digestive apparatus consists of one or more ramifying canals, terminating in blind extremities, and commencing in the sucking pores. Their ovaries, which are branched, are often proportionally very large and distinct. Description of flat worms.

The bothriocephalus and the tæniæ are the most remarkable of the flat worms. The former worm was, at one time, classed among the tæniæ; but it has been detached from that order by Bremser, who has placed it in another genus. I think, with Blainville, that the distinction is valid, on account of the important differences between them; which will be mentioned in the description of these animals. Classes of flat worms.

The bothriocephalus latus, formerly called the tænia lata, is the largest species of flat worm. Though very common in Russia and Switzerland, it is rarely met with in this country. It is often twenty, and has sometimes exceeded a hundred feet in length. The head has two naked openings. The articulations near the head are small and short, resembling transverse striæ: those which follow are also short but broad, and the last are elongated. The articulations are furnished with pores; which are placed in a single, or, at times, in a double row, near the middle of the articulations, on one of the flat sides. These pores appear to belong to the genital organs. This worm is sometimes nearly an inch in breadth. It is extremely obstinate, and often resists the most powerful means which are employed for its expulsion. Intestinal worms of the Bothriocephalus latus.

species bothriocephalus are said, by Bremser, to infest fishes
and aquatic birds.

The tænia solium, or ver solitaire, as it is erroneously
called, there being often more than one in the same subject,
is the common tape-worm of this country. It appears to be
found in most parts of Europe, except those in which the
bothriochephalus latus is common, and has been observed
in Egypt. Its head has four pores, in the centre of which
there is an obtuse armed proboscis. Although we often
look in vain for the head of the tænia, except when we
find the worm in the intestines after death, yet it some-
times happens that the head is voided from the bowels,
or ejected by vomiting. The articulations, with the ex-
ception of those near the head, are longer than they are
broad.

Tæniæ are believed to grow longer, by their joints in-
creasing in length, rather than by an addition to their num-
ber. They present, however, differences in their length,
which are not to be ascribed to difference of age. I be-
lieve that few persons are aware of the remarkable appear-
ance which the tænia assumes in its most contracted state.
I had no idea of it myself, until I received an interesting
communication on the subject from Dr. Barlow of Bath.
He informed me, in a letter dated the 25th of 10th month
(October) 1830, that, about a year before, after his usual
visit to the United Bath Hospital, he was about to leave
the establishment, when one of the nurses hastened to shew
him a worm which had just been passed in a stool by
a patient affected with acute rheumatism: it was about five
inches long, of a dark colour, and marked by numerous
rings. Not recognising any thing which he had ever before
seen, he directed it to be set aside, until he had an oppor-
tunity to examine it. It was, in his presence, put into
one of the porringers used for bleeding, together with a
little water to prevent its becoming dry; and then com-
mitted to the care of the apothecary's assistant. The next

day, on calling for the porringer, he was not a little asto-
nished to find, instead of his acquaintance of the preceding
day, a large mass of unfolded tape-worm, of considerable
length, white, flat, jointed, and in every respect such as
patients affected with tænia so often present to their me-
dical attendants after the successful exhibition of a ver-
mifuge. Though the Doctor was not aware that he had
ever met with a description of the tænia in the state in
which the one just mentioned was shewn to him, he sup-
posed that it might have been described by elminthologists;
but had sought in vain for such a description, when he sent
his account to me. He was therefore induced to believe
that the living tape-worm possesses the form and characters
of the worm just described, as it was first seen; that its
evolution is consequent on the death of the animal; and that
naturalists generally have been led into error, by taking
their accounts from the worm when dead, in which state it
is almost always seen. On perusing the Doctor's letter, I
immediately recollected having read, in Bremser's work,
that the flat articulated worms are elongated by the lengthen-
ing, rather than by the multiplication of their joints; and
also, that I had myself observed in some cold-blooded ani-
mals, the salmon for example, small and short worms, with
heads resembling those of the tænia, which I had supposed
to be young tæniæ. The fact, that we find in animals re-
cently killed, flat worms, such as the tænia, the bothrioce-
phalus, and the bothridium, elongated as we generally see
them in preparations, appears to me to be a proof that that
state is not merely a post-mortem appearance, but equally
natural to them with the contracted state in which the sub-
ject of Dr. Barlow's interesting communication was voided.
The short form cannot, on the other hand, be merely a state
of youth, as I had been led to imagine from the remark of
Bremser. The rapid change in Dr. Barlow's worm is
incompatible with such an idea. On referring to Bremser,
I found that he speaks of these worms in the contracted and

elongated states, but without mentioning the particular difference between the two. On stating to our friend Dr. Addison the circumstance related in Dr. Barlow's letter, he informed me, that he had once taken from a dead subject, a worm in the same contracted state as that described by Dr. Barlow, and that, having left it, a similar transformation took place. I once found, in making an inspection, a considerable portion of tape-worm in its elongated state, and still alive.

Evacuation of tæniæ.

The tænia is a very obstinate worm, and sometimes attains to more than ten feet in length. It is generally found in the small intestines, accompanied by abundance of mucus of an unhealthy character. Although it often resists the most powerful purgatives for its expulsion, it seems that certain states of the system are favourable to its coming away spontaneously. I have observed that this appears to be the case in fever ; and the fact, that the worm mentioned by Dr. Barlow was voided by a person labouring under acute rheumatism, tends to confirm this view.

Tæniæ endemic.

Tæniæ, like many other worms, appear to be endemic, or to attack the inhabitants of particular districts. I have been informed by my friend Dr. Knox, that our troops which were stationed in and near the Cape were generally infested by these animals. Many animals, besides man, are much incommoded by them. This is particularly the case with the dog and cat.

Fasciola or distoma, or fluke-worm.

Though the bothriocephalus and the tænia are the principal classes of flat worms found in man, yet others are occasionally met with. The fasciola or distoma, or douve, has been observed by several pathologists. Malpighi and Bidloo found it in the liver—Wepper and Pallas, in the hepatic duct—Chabert, in the evacuations of a girl—Bulholz, in the gall-bladder; and Brera, like his countryman Malpighi, in the liver of a person affected with scorbutus and dropsy. These worms, called also douve and flukeworms, are common in the livers of sheep, especially, it is

affirmed, of those which are fed in marshy districts and are affected with the rot; but they are found in sheep under other circumstances. They appear to be larger in sheep than in man. They are hermaphrodite; and are said mutually to impregnate each other, like snails.

The polystoma is, I believe, the only other species of Polystoma. flat worm found in man. It has six orifices. It is said to have been seen in the ovaries, and also in the veins; but this last statement is doubted, and apparently with good reason. It is met with in the urinary bladder of frogs, and in the branchiæ of fishes. They have marginal pores, which are placed sometimes on one side, sometimes on the other; but they do not alternate regularly. The articulations are very apt to separate from each other, and come away with the alvine evacuations, in the form of small fragments, which, from their resemblance to melon seeds, have been called cucurbitini.

Many other species of flat worms are met with in the Flat worms in the Boa. lower animals. Three snakes of the Boa kind, which I have seen dissected in this country, were all invaded by parasitical animals; amongst which was a peculiar species of flat worms described by Blainville, and termed by him Bothridium. The head is divided into two portions or lobes. This animal seems very nearly to resemble the Tricuspidares, which are mentioned by Cuvier as affecting the perch and some other fishes.

There is in the Museum a specimen of flat intestinal worm Flat worms in the horse. found by my friend Bracy Clarke in the colon of a horse. Its head in some respects resembles that of the tænia; but its body, as well as its articulations, are extremely short, and unlike those of any tænia which I have seen. I believe it to be the Alyselminthus perfoliatus, described by Blainville in the article 'Vers' of the *Dictionnaire des Sciences naturelles*.

3. OF CYLINDRICAL WORMS.

It now remains for me to speak of the cylindrical worms,

which are placed by Cuvier in his order of Cavitaires. They
are therefore possessed of a much higher degree of organi-
zation than the animals of which I have already spoken.
They constitute the division of Entozoa Nematoidea, in the
arrangement which I have employed.

Characters of cylindrical worms. The cylindrical worms present an elongated, round, and
elastic body. Their integuments are more or less fur-
nished with muscular fibres. In general, they are trans-
versely striated. They have an abdominal cavity, in which
floats an intestinal canal furnished with a distinct mouth
and anus. They have likewise distinct organs for the two
sexes, which are found in different individuals. They have
not hitherto been discovered to possess any vascular system,
and Rudolphi doubts their having a nervous system; but
Cuvier thinks that they have a nervous ring surrounding
the mouth, from which two nervous cords are prolonged
throughout the whole length of the body, running by the
side of each other. The intestinal canal is generally straight,
and pretty large. The œsophagus is often slender; and in
some species, the stomach is marked by the greater capacity
and strength of that part of the canal. The internal organs
of generation consist of very long tubes, which contain the
semen or ova, and open externally, at different points in
the different genera.

The genera which, from their occurrence in man, will
claim our principal attention, are the Ascaris, the Oxyuris,
the Trichocephalus, the Filaria, and the Strongylus.

Of the ascarides. I shall speak first of the Ascarides, as the most important.
Only one species of this class is met with in man: but if we
have recourse to the inferior animals, most of which they
likewise infest, we shall find that the species are very nume-
rous. They have round bodies, tapering at the extremi-
ties. The mouth is furnished with three fleshy papillæ,
from the midst of which there is occasionally protruded a
very short tube. In all those which have been dissected,
the intestinal canal is straight. The females are much more

numerous than the males. They have a single ovary, which
is divided into two branches. It is many times longer than
the body; and the external opening to its single oviduct is
situated towards the anterior quarter of the body. In the
males there is a single seminal tube, which, like the ovary
of the female, is much longer than the body. It communi-
cates with a penis, which in some instances is either double
or bifid. The penis is protruded from the anus, which is
situated near to the extremity of the tail.

The ascaris lumbricoides, or the lumbricus, as it is vul- Ascarides
lumbri-
coides.
garly called, is found, without any manifest difference, in
man, the horse, the ass, the zebra, the quagga, the ox, and
the pig. It has two longitudinal furrows, which are situated
opposite to each other; and the intestinal canal and the
genital organs may sometimes be seen through the integu-
ments. The ascaris lumbricoides is said to have been seen
upwards of fifteen inches in length; but its average length
is about seven or eight inches. It is slender and tapering
at both extremities, but is rather the most so at the head.
The males are generally smaller than the females; and
from their tails, which are curled, there sometimes projects
a double penis.

It has been stated, that the size of these worms bears
some relation to that of the individual in whom they are
found: for example, that they are smaller in children than
in adults. Though I believe, from my own experience,
that this assertion is founded on accurate observation, it
is by no means rigidly and invariably true. For, although
the lumbricoid ascarides which we meet with in children
are generally below the average size, they are occasionally
very large.

These worms are sometimes found in very great num- Numbers in
which these
worms are
found.
bers. I was present at the examination of the body of a
boy, who died in La Charité with symptoms of fever ac-
companied with gastric irritation and some degree of peri-
pneumony, in whose small intestines between fifty and sixty

of these worms were found. The mucous membrane in the
part where they were situated was quite pale. In two places,
intussusception had taken place; but even then, the intes-
tine did not appear discoloured, though in one of the places
five or six inches must have been received. In the stomach,
the duodenum, and the commencement of the colon, where
no worms existed, the mucous membrane was partially of a
light bright red.

The ascarides lumbricoides, when found in post-mortem
inspections, are generally met with, as in the case which I
have just related, in the small intestines, which are proba-
bly their natural habitation. At times, however, they are
either carried or make their way into the large intestines,
and are voided with the stools. At other times, in oppo-
sition to the peristaltic action of the intestines, they gain
the stomach; and have even been known to make their exit
from the mouth or nostrils. Instances are more rare in
which these worms have escaped from the body by preter-
natural openings. I remember however to have seen, when
I was attending the hospitals in Paris, a female, advanced
to a little beyond the middle age, who had parted with
several of the ascarides lumbricoides, from a very small ar-
tificial anus, situated near to the external abdominal ring.
This patient had been affected with hernia. Since that time,
the phænomenon has again come under my notice.

The presence of these worms is often attended with so
little inconvenience, that no symptoms are noticed, to in-
duce the suspicion of their existence. Frequently, how-
ever, there is not merely the convincing evidence furnished
by the occasional passage of a worm, but, also, general dis-
turbance of the health, emaciation, an insupportable sen-
sation of faintness at the epigastrium, fetor of breath, and
those various local irritations which, like the irregular and
fantastic movements in chorea, are sympathetic with the
irritation of the alimentary canal. Pinel noticed a pain of
this kind in and about the ancles, and, in one instance, in

the hand, which accompanied the presence of these worms in the cases of mucous fever, which occurred as an epidemic at the Salpêtrière.

It might probably be remarked with reference to all intestinal worms, but it seems to be notably true with respect to these, that a morbid state of the alimentary canal is connected with, and favourable to, their production and growth. Hence no class of persons are more subject to them than cachectic children. I have observed that the lumbricoides, as I have already noticed with regard to the tænia, are accompanied by an abundant secretion of unhealthy mucus. It is often thick, viscid, and opaque, bearing some resemblance to thick milk. Pinel has noticed their not unfrequent concurrence with that form of fever to which he has given the name of 'mucous,' from its being accompanied by a depraved and increased secretion from the mucous membranes, and to which he remarks that persons of the lymphatic temperament are most liable. This remark of Pinel is in accordance with the observations of Rhœderer and Wagler on the mucous epidemic which occurred at Göttingen. Broussais lays particular stress on the necessity which there is for a morbid, and, as he believes, an inflammatory state of the intestinal mucous membrane, as an essential condition in the propagation of intestinal worms. I have heard him, in his Lectures, interdict anthelmintics; and order that the gastro-enteritis should be treated, as the worms would be unable to exist in the healthy mucus.

The oxyuris vermicularis, which is the most common of all the intestinal worms, next claims our attention. Great numbers of these worms exist in the same individual. Children are particularly liable to be infested with them, but adults are by no means exempt. They are often present, without causing inconvenience, or giving rise to any particular symptoms; but they not unfrequently excite intolerable itching about the anus, and induce hæmorrhoidal

State of intestine in which worms are present.

Cachectic children.

Oxyuris vermicularis, formerly termed ascaris vermicularis.

Symptoms of its presence.

tumors. Sometimes they produce, sympathetically, a constant gnawing pain in the stomach, accompanied by an almost insupportable faintness. It is this circumstance which has led to their having been sometimes called 'mawworms.' They have been known to excite great irritation about the neck of the bladder; and some cases of satyriasis have been attributed to them. The oxyuris vermicularis seldom exceeds half an inch in length. The head is blunt: the anterior part of the body is the largest. In the male, the tail is crooked and obtuse: in the female, it is straight and flattened; and becomes so fine, that the extremity can scarcely be perceived without the aid of a glass. In the female, which is oviparous, the oviducts completely surround the alimentary canal. The seminal ducts of the male have not yet been seen.

Character of the oxyuris vermicularis.

Its seat.

The general residence of the oxyuris vermicularis is in the large intestines, but particularly in the rectum. They are said, however, to have been found in the small intestines, and in the stomach, or in a sac formed in its parietes. These cases are however doubtful; and still more so are the stories of their having been found in the œsophagus, and even in the ventricles of the brain. From the too prevalent ignorance of medical men with respect to this as well as most other branches of natural history, it is highly probable that some other worms, or the larvæ of flies, have been mistaken for oxyures.

The oxyuris vermicularis is an active little animal; and not unfrequently leaves the intestinal canal, and is found on the surface of the body. On quitting the rectum, they have been known to take up their abode in the pudenda.

Propagation of these worms.

The mode of invasion of most of the intestinal worms is very mysterious; but the habitual residence of the oxyuris vermicularis being so near the surface, together with the facility with which they move when out of the body, renders it by no means difficult to conceive their transfer from one individual to another. Facts are not wanting

to support the probability of this actually taking place.
These worms have been known to affect the different mem-
bers of a family, in a way which was readily accounted
for, by different individuals having made use of the same
bed.

Of the oxyures which infest rabbits and mice I can say Oxyures in the lower animals.
nothing, having never seen them. The oxyures which are
found in the rectum of the horse are by no means uncom-
mon, and have probably been seen by most of you. They
appear to excite a great degree of pruritus about the anus;
but are most likely to excite attention, from the circum-
stance of their occasioning a remarkable, light yellow, con-
crete substance to collect about and disfigure the funda-
ment.

The trichocephalus—or trichuris, as it was formerly called, Trichoce-phalus or trichuris.
the head having been mistaken for a tail—is the round worm
to which I shall next call your attention. It is thick poste-
riorly; and slender, like a thread, anteriorly. This slender
portion is terminated by a round mouth. There are seve-
ral species of trichocephalus; only one of which, the tricho-
cephalus hominis, or dispar, is met with in man. It is
about two inches in length, only one-third of which is
taken up by the thick part of the animal. This portion has
a spiral form in the male; which is furnished with a small
penis, protruding from near the tail. In the female, which
is oviparous, the thick portion is straighter, and is simply
pierced at the extremity. On the continent, it would seem
that this is the worm which is met with the most fre-
quently in the human intestines. Indeed, some of the most
distinguished elminthologists state that they scarcely ever
fail to find them. The large intestines are their principal
seat, but more especially the appendix vermiformis of the
cæcum. Though I have frequently and carefully sought
for this worm, I have only once been able to find it. In
this instance, it was lodged in the mucus filling the appen-
dix of an emaciated and cachectic girl, who had been much

exposed to want and hardship. The trichocephali, as well
as the ascarides lumbricoides, were very frequently met
with by Rhœderer and Wagler, during the epidemic at
Göttingen.

Filariæ.   The filariæ are another family of round worm; of which,
more than one species appear to infest man. They have a
long, slender, thread-like body, pierced before by a round
mouth. They are principally met with in cavities which do
not communicate externally — in the cellular membrane,
in the substance of the muscles, and in the parenchymatous
Filaria   structure of the viscera. The most remarkable of these is
Medinensis. the filaria Medinensis, or Guinea-worm. It is very common
in hot climates, where it is found insinuated under the inte-
guments, chiefly about the legs. It attains to the length of
ten feet or upwards : it is about the thickness of a probe,
and is pointed and hooked at the extremity. It would ap-
pear, from some authors, that it may remain for years
without exciting any great degree of pain or uneasiness.
When one of the extremities makes its appearance, the ne-
groes—for the treatment is very much left to them—secure
it by means of a small piece of stick, with a slit in it. They
carefully abstain from the use of any considerable force in
order to extract the worm; but rather suffer it to be gra-
dually drawn out by the light weight of the stick, round
which they wind the worm as fast as it comes out. In this
way the extraction is often protracted for several days.
When the worm unfortunately breaks, it probably dies;
since it is apt to excite great local irritation, and produce
troublesome abscesses. By some, these worms are supposed
to be introduced into the system by drinking the impure
water of the districts in which they are met with. By
others, they are said to be conveyed from one individual to
another : and it has been believed by many persons that
they are the larvæ of an insect. The fact is, that we have
no more acquaintance with the mode in which they enter
the system than we have respecting the origin of most of

the intestinal worms. For want of sufficient zoological
knowledge in the observers, these worms have been con-
founded with the gordius, a slender hair-like worm found
in fresh water, in mud, and on inundated grounds. There
is so much of the improbable and obscure in the accounts
recorded respecting worms in some respects resembling the
Guinea-worm, under the different appellations of dracunculi,
chætea, gordius, furia infernalis, &c., that, without further
means of gaining information respecting them than I am
likely soon to possess, I shall neither enter into the ques-
tion myself, nor trouble you with it.

Another species of filaria has been described as occur-
ring solitarily in the lungs of persons labouring under
phthisis, and is called the filaria bronchialis; or, by Trentler,
who has given the principal description of it, the hamularia
lymphatica; or, by Rudolphi, the hamularia subcompressa.
It is an extremely rare worm; and, by some, the existence
of such a species is doubted. However rare or doubtful
the existence of filariæ may be in the lungs of man, worms,
probably belonging to this family, are occasionally found, in
great numbers, in the lungs of some of the inferior animals.
I have seen very many of them in the lungs of two speci-
mens of boa or python which died in this country. The
lungs were at the same time very much affected with tu-
bercles. These worms possessed, in a remarkable degree,
that strong tenacity of life which is conspicuous in many
of the filariæ. Though one of these boas was not examined
till after decomposition had made considerable progress,
the worms were perfectly lively; and one of them, which
I removed from the body, continued to live for many days in
a small quantity of water placed between two pieces of glass,
one of which was concave. In the lungs of one of these boas,
my friend Thomas Bell and myself found another species
of worm, which is clearly not a filaria; but to what family
it should be referred I am not able to say. It bears·
some resemblance to a polystoma figured by Blainville.

Filaria bronchialis.

P

Besides the three families of round worms of which I
have been speaking, some other kinds are occasionally,
though very rarely, met with in man.   Of these, the
strongylus gigas is the most remarkable.   It is described
as the largest of all the intestinal worms; and is said to be
two or three feet, or even more, in length, and as thick as
one's little finger.   The most frequent seat of its develope-
ment is one or other of the kidneys, though it has been found
in other organs.   It is met with in different animals, as the
dog, the wolf, the marten, and, at times, in man.   When
found, it is coiled up, distending the organ in which it is
situated, and occasioning the destruction of its glandular
structure.   Strongyli of this species have sometimes passed
off by the urethra, whilst they were yet of small size.
They are generally of a bright red: they have six papillæ
around the mouth: the intestine is straight: the ovary
is simple, from three to four times the length of the body,
communicating externally by an opening situated a little
behind the mouth, and by its other extremity reaching
to the anus.

In the Transactions of the Medico-Chirurgical Society,
Lawrence has given a very interesting case of a female,
who from time to time voided many hundreds of small
worms from the urinary bladder.   It does not appear quite
clear, whether they were a species of strongyli, or consti-
tuted a new species, for which the name of spiroptera
hominis has been proposed.

There is another species of strongylus, which, though not
found in man, deserves a short notice. This is the strongy-
lus equinus, or armatus.   It is about two inches in length:
the head is hard and spherical; and the mouth is sur-
rounded by small soft spines.   It is the worm of the most
frequent occurrence in the horse.   It penetrates even to
the arteries, in which it causes aneurism.   It is found also
in the mule and the ass, and is perhaps more common in
this last than in the horse.

A small species of parasitical animals has lately been discovered affecting the muscles of voluntary motion, amongst the fibres of which they have been found generally dispersed over the body. They consist of very minute cysts, of an oblong figure, in size and colour bearing considerable resemblance to the young of pediculi attached to the hair of persons of dirty habits. When examined with a lens, these little cysts are seen, in many instances, not to be perfectly ovoid, but to be irregularly contracted towards one extremity, so as to form a sort of short and imperfect neck. It is also not uncommon to find some opacity towards one or both of the extremities. They are placed in the direction of the fibres; and are lodged in the cellular membrane immediately investing the muscular fibrillæ, or the tendinous fibres to which they are attached. When the specimen is sufficiently recent, one, and sometimes two thread-like worms may be discovered coiled up in each of the cysts. This little worm was first seen by that indefatigable and talented naturalist Richard Owen, who has minutely and carefully examined it, and who regards it as somewhat allied to the eels found in paste and vinegar. He has given it the name of trichina spiralis.

The trichina spiralis.

The first observation of these little bodies, with which I am acquainted, was made in 1828, by my friend and former assistant, H. Peacock; who, considering it as a remarkable affection of muscular structure, made a dry preparation of the sterno-hyoideus, to exhibit it. In this state, the true nature of the affection was neither known nor suspected. A short time after, my friend J. Hilton observed two or three cases in the dissecting-room at Guy's, and drew up a good account of its occurrence, and of the various appearances presented by the cysts; but the enclosed worm remained undiscovered, although the cysts had been carefully examined by J. J. Lister; the specimen being either too far decomposed, or otherwise unfavourable to the examination. J. Hilton's paper, accompanied with illustrative drawings,

Discoverers of this worm.

was presented to the Medical and Chirurgical Society, and
there read; but its publication was suppressed by the Council.
At a later period, some cases of trichina occurred at Bar-
tholomew's Hospital, and furnished the specimens described
by Richard Owen and Dr. F. J. Farre.   Two or three
examples of trichina have since been met with at Guy's;
and the organization of the little worm has been seen both
by R. Owen and J. J. Lister.   They have also been obser-
ved in Edinburgh, in the dissecting-room of my friend Dr.
Knox, who has given an account of it in the Edinburgh
Medical and Surgical Journal.   The trichina appears to be
wholly confined to the muscles of voluntary motion, and to
the tendinous fibres immediately connected with them.   In
these situations they are often very numerous.   Having
found them in the same case in every muscle of the body
which I examined, even to the lumbricales of the foot, I
looked for them in the œsophagus.   Not a trace of them
was to be discovered : they stopped abruptly at the lowest
contractor of the pharynx.   This fact, which I have subse-
quently found confirmed by the observations of Dr. Knox,
may be added to others which distinguish the contractile
fibrous coat of the alimentary canal, and of some other
cavities, from true muscular structure.   I ought to observe,
that the heart, notwithstanding its undoubted muscularity,
was free from the trichinæ.

Seat of the
trichina
spiralis.

No symptoms have hitherto been observed as patho-
gnomonic of the presence of trichinæ.   Though they have
been repeatedly found in cachectic subjects, this has not
been invariably the case.   It appears that the minute cysts
enclosing the trichinæ may become ossified or earthy, like
those which enclose dead hydatids.   This state is probably
assumed when the worm has died and become invisible;
Richard Owen having in vain sought for the worm in
such cysts.   It is probable, that extreme youth, or other
circumstances, may also render the worm invisible; since,
though often easily discovered, it escaped observation in

the first case examined by J. J. Lister; and it has repeatedly been sought for, without success, in other cases mentioned by Dr. Knox.

A small worm, but little larger than the trichina, has been found in great numbers beneath the mucous membrane of the alimentary canal in the horse. It has been described by Dr. Knox, who conjectures that it may be allied to the trichina, although it wants the cyst; but I am inclined to think that Richard Owen is correct in regarding these worms as minute specimens of the strongylus armatus.

I must not quit the subject of entozoa without noticing the microscopic and very remarkable animalcules discovered in semen. They have been particularly investigated by Prevost and Dumas; who state, that they are to be found in the semen of all animals capable of propagation, but that they are absent in that of the mule, and that of other animals who may be sterile from age or season of the year. Very slight differences are noticed in the seminal animalcules of different species; but they all agree in having slightly oblong and flattened heads, with lengthened tails, tapering so as to become nearly or quite invisible with the best glasses: they possess active powers of motion, and are evidently endowed with sensation. No trace of organization has yet been discovered in them, probably on account of their extreme minuteness. Whether essential to generation or not, they may be regarded as the parasites of the tubuli seminiferi. They are called *circoria seminis*, by Richard Owen, who classed them with the trichina.

Seminal animalcules.

A great number of feigned and imaginary complaints have been referred to parasitical worms: and as those by whom the deception is intentionally practised not unfrequently endeavour to confirm their assertions by the production of worms which they represent to have come from the body, it becomes the more necessary that medical men should make themselves acquainted with the characters and

Presence of worms frequently feigned or imagined.

appearance of the true intestinal worms; and that they should be aware, that not merely common lumbrici, and other extraneous worms, are at times passed off as intestinal, but, also, that worm-like bodies are manufactured out of sheep's intestines, and exhibited by quacks in proof of the efficacy of their remedies.

PARASITIC INSECTS.

Parasitic insects. Parasitical animals belonging to the class of insects have so little connection with appearances met with on inspection, that I shall only hastily glance at them, for the sake of completing the subject. Many of them—as, for example, the various species of pediculi or lice—follow in the train of filthy idleness, and render it the inflictor of its own just punishment.

Pediculus humanus corporis. Of the pediculi there are three principal species:—1. The pediculus humanus corporis, or body-louse. Though a careful attention to cleanliness is, in general, a sufficient security against these odious insects, it is a remarkable fact, that some individuals, in spite of the greatest attention, are constantly annoyed by these vermin. This peculiarity appears to run in families; an illustration of which is said to exist in one of the first aristocratic houses in this country. Particular districts are peculiarly infested with them. To this day they may be numbered amongst the plagues of **Pediculus capitis.** Egypt. 2. The pediculus capitis, as its name implies, affects the head. And, 3. The pediculus pubis confines itself to **Pediculus pubis.** spots covered by that particular kind of hair which makes its appearance at the period of puberty. A distinguished naturalist of this country, who was making the study of insects an object of his particular attention, by way of experiment lodged one of these insects in the hair about the pubes; but unfortunately lost sight of the incident, until his attention was recalled to it, by discovering that his whiskers had been colonized by a prolific detatchment from the mother country.

The pulex irritans or flea, and the cimex lectuarius or bug, are too well known to require any description. In this country they are comparatively a trifling inconvenience, which, by care and attention, may be either wholly averted, or rendered scarcely perceptible: but in more southern latitudes, as I can myself testify, they become a source of inevitable and serious annoyance. The pulex penetrans is an American insect, and is much more formidable. It makes its way under the skin of the hands and feet; where it not only continues itself, but deposits its eggs, which are rapidly developed, and produce small tumors, which occasionally lead to serious and even fatal ulcers. When they have taken up their residence, they are dexterously detached by the negroes.

Pulex irritans, and cimex lectuarius.

Pulex penetrans.

Several species of acarus likewise affect the skin, either simply attacking the surface, or penetrating beneath it. It was long since conjectured, that that odious affection called the itch depended on the presence of an insect of this species; but such unsatisfactory and erroneous descriptions were given of it, that the fact has been generally doubted. It has, however, been recently fully confirmed by the labours of Renucci, a Corsican physician, who graduated in Paris last year. The insect in question, to which he has given the name of acarus scabiei, is so small, as to be only just perceptible to the naked eye. Cutaneous affections, resembling the itch in man, but peculiar to some of the inferior animals, such as, the horse, the sheep, and the cat, have likewise been shewn to depend on acari, by Bosc, Walz, Gohier, and others.

Acarus.

Acarus scabiei.

The œstri are the most remarkable of the parasitic insects; but as they are wholly confined to the inferior animals, I shall say very little respecting them. They belong to the class of dypterous insects; and pass the state of larva and chrysalis, or that of larva only, in the body of the animal on which they prey. Different species are found attacking different animals: some, as the horse-botts, inhabit the

Œstri.

alimentary canal: others, as the botts of the sheep and the stag, the frontal sinuses and other cavities : others, as the œstri of the ox and the rein-deer, take up their abode under the skin. One species, the œstrus equi, deposits her eggs about the knees and shoulders of the horse, where they may be within the reach of his tongue ; so that he becomes himself the principal agent in introducing these parasites into his system. The eggs of the œstrus hæmorrhoidalis are deposited about the lips of the horse.

Cuterebræ.   The cuterebra, a genus found by my friend Bracy Clarke, is also dypterous, and closely allied to the œstri. They are found on rabbits in America, and, notwithstanding the smallness of the animal on which they prey, are large insects. They take up their abode under the skin. Those who are desirous of studying this branch of the subject will find much new and interesting matter in the work of my friend Bracy Clarke; whose labours, on this and various other subjects connected with the natural history and economy of the horse, are of great value and importance. The mode of propagation of the horse-botts is very curious ; and deserves some attention, as illustrating the expedients to which nature has recourse, in order to convey the germs of animals into the nidus suited to their developement.

How do parasitic animals enter the system ?   I shall now revert to the consideration of the mode in which parasitical animals enter the system. In the case of the horse-botts, which I have just related, investigation has been repaid by the most satisfactory and conclusive results ; but with respect to the diffusion and propagation of the entozoa, the difficulties are much greater. The oxyuris vermicularis is, perhaps, the only species of whose transfer from one individual to another we have any decided proofs. In the absence of evidence, conjecture has been by no means inactive. Some have supposed that the animalcules which exist as entozoa in man and other animals also exist in other situations, under different appearances; and that their forms are changed when they become parasitic. This

supposition appears to me to be extremely unsatisfactory
and improbable; and I think I could as easily believe Ovid's
Metamorphoses, as become a convert to such a doctrine.
The great obscurity which hangs over the subject, the
difficulty of accounting for the entrance of the germs into
the system, and the extremely low degree of organization
possessed by a few of these animals, have induced some
naturalists to cut the knot; and either to call in the assistance
of spontaneous or equivocal generation, or to deny the pos-
session of a separate vitality to some of the classes of para-
sitical animals, and more particularly to the hydatid.   Some
have almost as gratuitously contended that such animals
are propagated by germs of invisible minuteness, which,
pervading every thing, are taken in with our food, and with
the air which we breathe.

I confess my inability to clear up a question of such diffi-
culty.   I think, however, that we may be guided by analogy,
and need not despair of our researches being ultimately
successful.

I have remarked, that the extreme obscurity in which the
origin and propagation of some of the parasitical animals,
which infest the most deeply-seated parts of the frame, is in-
volved, has induced some pathologists and naturalists to adopt
the idea, that, instead of being produced by germs or ova
derived from individuals of the same genus, they are the re-
sult of spontaneous or equivocal generation.   Although there
appear to me to be strong reasons against adopting this theo-
ry, in the case of most, if not of all our parasitical animals,
yet the idea of the production of a new species, or, in other
words, spontaneous or equivocal generation, is not to be
wholly rejected, without some examination.   We have strong
facts, to shew that the production of distinct species of ani-
mals of the higher classes has not been limited to one spot
of the earth, or to one period of time.   Different parts of
the surface of the globe have their distinct and peculiar
animals, as well as vegetables.   Many animals are found on

*Spontane-
ous or equi-
vocal gene-
ration.*

the American continent of the ruminant and carnivorous
classes, as well as of the Rodentia and Pachydermata,
which are quite peculiar to that continent.   In Australia
we find a still more distinct production of animals, consti-
tuting the class of Marsupialia, and comprising numerous
divisions.   I am unable to conceive any other explanation
of this fact, than the natural conclusion, that the several
groups of animals were created in the regions in which they
are found, and were there adapted to their peculiar localities.

Arguments
to shew that
spontaneous
generation
is not im-
possible.

The evidence of the creation of animals having taken
place at different times, is at least as conclusive as the ar-
guments which I have just adduced in favour of their pro-
duction on different parts of the globe.   The researches of
the geologists have shewn us the remains of numerous ani-
mals once inhabiting the earth's surface, but now extinct.
The researches of similar labourers have shewn, that at the
time that these animals possessed the earth's surface, those
animals with which we are at present acquainted, with some
few exceptions, did not exist.   It is not merely one, but se-
veral changes, with respect to the species of animals inha-
biting it, which the surface of our globe has witnessed.   Let
it not be supposed that these facts, which extend our view
of the operations of creative power, can be applied to man,
or that they in any degree militate against the authenticity
of the Mosaic record.   I have merely adduced these facts
to shew that the creation of organized beings has not been
limited to one spot or to one period ; and that therefore it
may not be unreasonable to suppose, that even now new
species may be called into existence : but it would have
the tendency to damp our zeal in the investigation of the
operations of nature, and turn us aside from the acquisition
of truth, were we gratuitously to call in the assistance of
such a theory, to solve difficulties like those which obscure
the propagation of parasitical animals.   Indeed, the facts of
the case are strongly opposed to the admission of this theory
with respect to them.   We have seen that the different ani-

mals have their peculiar parasites; and in the case of tænia solium, and bothriocephalus latus, that, in different regions, a different species of parasites attacks the same animal; but having recognized these different species, we find the same species occurring with strict uniformity of character in a great multitude of individuals; which seems to compel one to admit the probability that they are derived from a common origin, and are propagated by generation; since reference to spontaneous generation would almost necessarily pre-suppose the multiplication of species as well as of individuals. With respect to some of the parasitical animals of which the mode of diffusion was once obscure, we now possess conclusive and satisfactory evidence. The labours of Bracy Clarke have done this for the several species of horse-botts; and no doubt can remain respecting the passage of the oxyuris vermicularis from one person to another.

I cannot conclude this Lecture without remarking, that the subject of parasitical animals forms a point at which the limits of our science are adjoining the confines of Natural History. In this respect it resembles the study of the Materia Medica: and I would unite my voice with that of your distinguished teacher of that department, in strongly urging you to take advantage of the valuable Lectures delivered by my friend Thomas Bell; and to cultivate the science of Natural History, not merely as one most interesting in itself, and most intimately connected with your own, but because, more than any other, it calls forth the exertion of those faculties of the mind on the strength and activity of which the attainment and cultivation of our profession essentially depend. The honour and reputation of our country, in some sort, demands it of you: for whilst our numerous, large, and widely-scattered colonies, and our yet more extensive commerce, give us unrivalled facilities for placing the whole surface of the terraqueous globe under contribution to this science, we have allowed ourselves to

Parasitic animals, a connecting link between Pathology and Natural History.

be outdone by our neighbours, even in that very element on
which repeated triumphs have given us, what those who
glory in warlike exploits regard as a proud prerogative;
we have neglected the more worthy objects of ambition;
and have left its rich zoological treasures to be explored
and appropriated by others. I can think of no more
powerful means for removing this opprobrium from our
country, than for all our medical men, but especially those
who are likely to go abroad, to make themselves more or
less masters of some of the various branches of Natural
History.

LECTURE VIII.

ON THE

ADVENTITIOUS SEROUS MEMBRANES.

DISTINCTION BETWEEN THESE STRUCTURES AND HYDATIDS INSISTED ON.—
DIVISION OF CYSTS INTO THOSE FORMED AROUND BODIES ALREADY EXIST-
ING, AND THOSE WHICH SECRETE THEIR OWN CONTENTS—CYSTS OF THE
LATTER CLASS, WHICH ARE TO BE DISTINGUISHED FROM ADVENTITIOUS
SEROUS CYSTS.—ADVENTITIOUS SEROUS CYSTS DIVISIBLE INTO TWO OR-
DERS, THE SIMPLE AND COMPOUND — DESCRIPTION OF SIMPLE ADVENTI-
TIOUS SEROUS CYSTS, AND MENTION OF THE SITUATIONS IN WHICH THEY
ARE FOUND — COMPOUND SEROUS CYSTS, MOST FREQUENTLY FOUND IN THE
NEIGHBOURHOOD OF THE UTERUS—THEIR CHARACTERISTIC IS THE PRO-
DUCTION OF INFERIOR CYSTS ON THEIR INTERNAL SURFACES—VARIETIES
OF FORM WHICH THESE INFERIOR CYSTS PRESENT : 1. THE INTERMEDIATE
FORM, REGARDED AS THE TYPE OF THIS FORMATION—PHÆNOMENA PRE-
SENTED BY THESE INFERIOR CYSTS, AS, *ex. gr.* RUPTURE OF THE PARENT
CYST, INFLAMMATION, &c.—2. THE PEDUNCULATED FORM OF SECONDARY
CYSTS — PHÆNOMENA PECULIAR TO THIS VARIETY — CASES TO ILLUSTRATE
THE FIRST AND SECOND FORMS OF INFERIOR CYSTS.—3. THE FLATTENED,
BROAD-BASED VARIETY OF SECONDARY CYSTS — PECULIAR FEATURES OF
THIS FORMATION—ILLUSTRATIVE CASE—CAUSES WHICH INFLUENCE THE
FORMATION OF OVARIAN CYSTS AND THEIR EXTRAORDINARY SIZE—IRRITA-
TION WHICH THEY EXCITE IN THE SURROUNDING PARTS — COMPOUND
SEROUS CYSTS IN THE TESTICLE, OR PSEUDO-HYDATID TESTICLE—COMPOUND
SEROUS CYSTS IN THE FEMALE MAMMA, AND IN THE EYE.

GENTLEMEN,

You will recollect, that before the last Lecture, which was
devoted to the subject of parasitical animals, we had for
some time been taken up with the consideration of the
morbid appearances presented by the serous and the syno-
vial membranes. We had, however, almost wholly confined
ourselves to the examination of those membranes of the
serous class which naturally exist as an essential part of our
frame. It still remained for us to examine those serous
membranes which are occasionally found in various parts of

the body, as the result of an irregular or accidental produc-
tion.   The bladders, sacs, or cysts which constitute some of
the forms in which these adventitious membranes are met
with have been so often confounded with other circum-
scribed collections of fluid generally known by the name
of hydatids, and, by most, supposed to be possessed of a
separate and peculiar vitality, that a description of true hy-
datids, and an examination into their nature, appeared to
me to be an essential prelude to the consideration of the
adventitious serous membranes in question.   This, as I
have already explained to you, was my principal induce-
ment for making a temporary digression into the subject of
parasitical animals, to which the investigation of the nature
and habits of true hydatids or vesicular worms, in my opinion,
essentially belongs.   Whether you are disposed to go with
me thus far or not; whether you admit the existence of a
separate life in those perfectly-detached, spheroidal bladders
which have been called acephalocysts, and which are pos-
sessed of such an astonishing power of multiplying their
species; or whether you prefer the opinion of those who are
unwilling to concede to them the attribute of an independent
life; the importance of a marked distinction being drawn be-
tween them and the adventitious serous cysts, of which we
have now to treat, will remain absolutely the same.   I am
induced to lay the stronger stress on this distinction, from
the circumstance, that one or more distinguished pathologists,
both by theory and practice, by precept as well as by example,
have taught that the distinction was a mere verbal quibble.
I trust, Gentlemen, that you have retained in your memo-
ries a sufficiently lively recollection of the characters of
true hydatids, of their mode of production, of the changes
which they undergo, and, above all, of the influence which
they exert on surrounding parts, to be fully able to per-
ceive and appreciate the essential difference which in all
these respects exists between true hydatids and serous cysts
of accidental or adventitious production.

The adventitious serous membranes, as I have already said, have been very often described by pathologists under the name of hydatids: and, without at present noticing the confusion into which modern authors have fallen by the use of this term, I cannot give a better idea of the vagueness with which it has been employed, than by observing, that Leeat declared that the eye was a perfect hydatid, and that an hydatid was an imperfect eye. The membranes in question have also been designated cysts; but this term has been used in as vague a manner as the word hydatid; and though, in many respects, it is a very convenient one to express generically the envelopes of various fluids and other matters occasionally found in the body, still some further definition must be given, when we wish especially to point out particular sacs, which owe their origin to the adventitious production of serous membranes.

By some pathologists, cysts have been divided into two classes. The first includes those which are formed about the bodies which they contain, whether these bodies have been produced in the system, or have been introduced from without; examples of which kind of cysts we see in the capsules which shut up bullets, shot, &c., and in the condensed cellulo-membranous envelopes to true hydatids, to the masses of hair and fat formed in the ovaries or elsewhere, and to the remains of tubercles and abscesses. The other division of cysts comprises those sacs which produce as well as circumscribe their contents. The cysts of which I am now to speak, belong to the second division; but, as there are many kinds of cysts to which the definition I have given is equally applicable with adventitious serous membranes, it will be necessary that I should exclude these from the class with which we are at present engaged.

So far as I have looked into authors who have treated on this branch of morbid anatomy, there appears to have been so much confusion and obscurity connected with it, as to convince me that it is one of considerable difficulty; and I

must confess that I enter upon it with much diffidence, lest,
in endeavouring to point out and avoid some palpable errors

of others, I should fall into similar inaccuracies myself. For
my present purpose, it will suffice to point out, as briefly
as possible, some of those cysts which, having been classed by
some pathologists with the adventitious serous membranes,
must now be distinguished from them; since they do not
participate in the peculiarities which I am about to describe,
but are possessed of a pathological character of their own,
which entitles them to be spoken of separately.

1. I need scarcely remind you, that the true hydatid is a
sac which secretes or produces the fluid which it contains.

2. Various cysts are not unfrequently met with beneath
the common integuments, and apparently very intimately
connected with them, which contain a sebaceous, meleceri-
tious, artheromatous, or other collection, which is at once
both the product of the sac and the cause of its distension.

3. Cysts are occasionally found which secrete the mate-
rials contained in them, and owe their origin to canals of
which the orifices have been more or less completely ob-
structed : such are, cysts in the labial glands; ranula;
those formed by the dilatation of the lactiferous tubes; and
those in the pancreas. To these we may add the cysts so
often found on the surface of the kidneys, and occasionally
on the liver; which, on account of the delicacy of the struc-
ture in which they are situated, we judge, rather from in-
ference than from demonstration, to be occasioned by the
obstruction of an excretory canal. Cysts of this kind are
sometimes found in the testicle.

4. Other cysts belonging to the class of cysts producing
their contents, but not to be confounded with the adventi-
tious serous membranes, are produced by the distension of
cells naturally existing in the body, but of which the con-
tents, from unexplained causes, have become morbidly
increased, and not unfrequently, at the same time, more
or less changed in quality. Of this description are the

enlarged vesicles of De Graeff; which, though very rarely,
if ever, so much enlarged as to constitute ovarian dropsy,
as some have supposed, are nevertheless frequently met
with many times larger than their natural size.

5. Cysts, which, from the description that has been given of
them, in all probability produce as well as enclose the fluid
found within them, are generally met with in the thyroid
gland, when enlarged so as to form the disease known by
the appellations of 'goître' and 'bronchocele.' These cells
very probably depend on the original structure of the
thyroid gland; but we know so little positively of either the
structure or the functions of this body, that it would be
rash to offer a decided opinion on this point. The sub-cu-
taneous cellular membrane is occasionally affected with
dilatation of its cells at a particular part, giving rise to a
tumor made up of cysts, which must be classed in this
group.

Such are the principal forms of cysts which, from the cir-
cumstance of their producing as well as enclosing the mat-
ters found in them, have in some arrangements been classed
with the serous cysts. As it has been my wish merely to
point them out on the present occasion, sufficiently to
ensure the distinction which I wish you to keep in mind,
I shall now proceed with the subject more immediately be-
fore us.

The adventitious serous membranes, like those naturally
existing in the body, form completely shut cavities. As far
as it is in our power to ascertain, they are wholly, or at least
with but very few exceptions, the result of an entirely new
formation dependent on some anomaly in the function of
nutrition, but respecting the precise nature of which we
are completely in the dark: and were I to offer any thing
respecting it, I could do so only as a conjecture, which I am
unwilling to mix up with the facts which it is my desire
faithfully to lay before you. On the present occasion, I
shall divide the serous cysts into two classes. The first

Division of
adventitious
serous
membranes
into two
classes—
the simple
and the
compound.

comprises those which are simple, and for the most part
solitary ; but which, if accompanied by one or more similar
membranes, owe this association to the accidental circum-
stance of the same cause which produced the one having
likewise operated in its neighbourhood, and not to the sac
itself possessing the remarkable property of giving origin to
new growths having the same character with itself.   Re-
specting this first class I shall have but little to offer.   If
there are any of the adventitious serous membranes which
can be said to be formed from a pre-existing structure, and
not to be the result of a new formation, they are to be

Formation
of simple
adven-
titious se-
rous mem-
branes.

found in this class; since it is possible that some of them
may have been produced by the distension of one or more
of the cells of the cellular membrane, which a partial in-
flammation, or some other cause, may have shut off from
their communication with the adjoining cells.   This sup-
position is the most plausible in the instances of the ad-
ventitious synovial bursæ, such as those which are formed
upon the patellæ in persons who are accustomed to kneel-
ing, and of the ganglia formed in the neighbourhood of the
sheaths of tendons.

Serous cysts of the simple class are formed in various
parts of the body.   Without entering into a minute descrip-
tion of them, I shall enumerate and describe some of the
most remarkable.

Situations
in which
these simple
adventitious
serous
membranes
are formed:
—within
the cra-
nium :

Within the cranium of a female, who had not been ob-
served to present any cerebral symptom, I noticed a thin
and delicate serous cyst, perfectly circumscribed, and filled
with transparent colourless serum.   It was of about the size
of a nut; and was situated at the base of the brain, not far
from the tractus opticus.   Clusters of serous cysts are often
found in the plexus choroides; and, notwithstanding their
number, I am quite disposed to think that they belong to
the class of simple cysts of which I am speaking, since their
number does not appear to depend, in any degree, on a
disposition in the parietes of these cysts to produce others

of an inferior order. These serous cysts in the plexus
choroides are manifestly vascular: they seldom exceed the
size of small currants, and are often much smaller: yet,
as I have already mentioned, Dr. Hooper has given a plate
of a very interesting case of this kind, in which the vascu-
lar cysts in the plexus choroides were nearly as large as
eggs. It has been supposed that these cysts in the plexus
choroides are formed by the dilated extremities of vessels;
some persons fixing on the arterial system, some on the
venous, and others on the absorbent. It has even been
attempted to prove this supposition, by blowing air into
these vesicles through the vessels in question: but were
the possibility of doing so fully proved, which, after all,
appears to me to be very doubtful, it would by no means
be a demonstration of the origin which has been attributed
to them; since it was long ago shewn, by Meckel, that the
vesiculæ seminales may be inflated from the veins or ab-
sorbents of the pelvis.

Simple serous cysts are occasionally formed in the eye- —in the
lids; and, since they constitute a very legitimate subject for eyelids;
surgical operation, they merit particular attention. Some
are found along the edges of the tarsi; where they seldom
acquire more than a moderate size, and their removal is
effected with comparative ease. Those which are situated
more completely in the body of the eyelid, and which at
times extend pretty deeply into the orbit, present more
difficulty in their treatment, and are more serious in their
consequences. I remember to have seen a young woman
in La Charité, under the care of Baron Boyer, who was
affected with a cyst of this kind, of nearly the size of a
chesnut. From the depth to which it extended into the
orbit, it was not thought expedient to attempt the total re-
moval of the sac. It was hoped, however, that when the
greater part had been removed, the remainder might be
obliterated by the adhesive inflammation; but, instead of
this result being obtained, a high degree of irritative fever

Q 2

carried off the patient in a very few days. When these tumors of the eyelids are of moderate size, it is generally recommended to remove them from the inner side of the lid, in order to avoid the disfigurement of an external scar.

—in the lungs ;

Simple adventitious serous cysts are stated to occur sometimes in the lungs. Laennec mentions one or two instances of this kind; but says, that they are more frequently met with in the lungs of inferior animals, and in those of the ox in particular, than in those of man. I have never had an opportunity of witnessing a case of the kind myself, and shall therefore not attempt to describe them.

—in the female mamma ;

It would appear that the female mamma is at times the seat of simple adventitious serous cysts; and that the cure of the tumors, to which they give rise, may often be effected by allowing the contents to escape; after which, adhesive inflammation, either spontaneous, or artificially excited, unites the sides of the cyst, and obliterates its cavity.

—in the neighbourhood of the uterus.

The most frequent seat of these cysts, and the last of which I shall here speak, is in the neighbourhood of the uterus, but more particularly in the folds of the broad ligament, or intimately connected with the ovaries, if not imbedded in their substance. I have already spoken of these, when I was describing the morbid appearances which are met with on the attached surface of the serous membranes. Cysts of this kind at times acquire a very large size; and constitute one of the forms of what is commonly called ovarian dropsy.

Second or compound class of adventitious serous membranes.

I shall now speak of the second class of adventitious serous membranes, or of those whose parietes present the very remarkable property of producing other cysts of a similar character with themselves; or morbid growths, which, if they do not present, strictly speaking, the character of cysts, are nevertheless referrible to the same type or mode of formation. Cysts of this kind, like those of the preceding class, are found in different parts of the body; but they are by far the most frequently met with, acquire

the largest size, and present the greatest variety of appear- Comp and
serous
cysts most
frequent in
the neigh-
bourhood
of the
uterus.
ances, in the neighbourhood of the uterus, but more espe-
cially in the ovaries and in the folds of the broad liga-
ments.   I shall therefore commence by describing these;
because the large scale on which they may be seen, renders
their structure the more easily intelligible.   Since this
affection, especially when situated in the neighbourhood of
the uterus, is not calculated to lead to a speedily fatal termi-
nation, we rarely obtain an opportunity of witnessing the
early stages of this form of encysted dropsy; but, on the con-
trary, the external or superior cyst generally acquires a very
large size, and gives, in some instances, the most unwieldy
dimensions to the abdomen.   Although the operation of
paracentesis may have shewn that the fluid by which the
cyst was at first filled was of a decidedly serous character,
it is very materially altered before the fatal termination of
the case; when the fluid is often of a mucous, or of a sero-
purulent character; and when it frequently happens, that
the cyst itself has, to a great degree, lost the characters of
a serous membrane.   Its parietes appear to be rather fleshy Characters
of a com-
pound se-
rous cyst
formed
about the
uterus.
than membranous; and the internal surface becomes more
or less generally roughened, as if by ulceration or abrasion.
The most important feature which it presents, is the appear-
ance of tumors and elevations, dispersed more or less
thickly over the internal surface.   These tumors, notwith-
standing the very great variety which at the first view they
seem to present, are, nevertheless, referrible to one general
mode of formation.   The forms which these elevations
assume are various: and I request your particular attention
to the description of them, which I am about to give.

I shall commence with the description of that form which Description
of the va-
rious forms
which ele-
vations on
the internal
surfaces of
compound
cysts as-
sume :
is intermediate between the two extremes; not merely be-
cause I shall more readily proceed from this, as a standard,
to the explanation of its modifications, but also because the
peculiar structure is here the most distinct and intelligible.
In this form we observe, on the internal surface of the

principal cyst, more or less rounded elevations, of various
sizes, projecting into the interior of the cavity, and covered
by a membrane which is continuous with the lining of the
principal sac.   On making an incision into these tumors,
we find that they themselves consist of cysts filled by a
secretion, often serous, but almost as frequently mucous.
It is not, however, merely by this secretion that the cyst is
filled.   On looking more minutely into it, we shall generally
find that from one or more points on the interior of these
cysts there grows a cluster of other or tertiary cysts, upon
which is reflected the lining membrane of the cyst in which
they are contained.   Cysts of the secondary order not un-
frequently afford as complete a specimen of a reflected
serous membrane as either the pericardium or the tunica
vaginalis.   The proportion which these contained cysts bear
to the cavity of the reflected membrane is extremely va-
rious.   Sometimes, especially when it is of a serous cha-
racter, it nearly fills the containing cyst, whilst the bunch
of inferior cysts is of very inconsiderable size : at other
times, the superior cyst is almost entirely filled by those of
the inferior order ; in which case, we may generally find that

the nodulous or tuberose elevations which we may have
observed on the exterior of the containing cyst are occasio-
ned by the unequal developement of the contained cysts ;
for those which have grown most rapidly, and attained the
largest size, forcibly dilating that part of the superior cyst
which is reflected over them, occasion a kind of hernia at

that part.   It sometimes happens, that the distension occa-
sioned by the growth of the inferior cysts is sufficient, not
only to disturb the even surface of the superior cyst, but
actually to produce a rupture, which admits both of the
escape of its fluid contents, and of the unrepressed growth
of the inferior cysts.   The inferior cysts themselves are
found to contain a serous or mucous secretion ; and very
often produce another order of cysts, possessing the same
character with themselves.

It is certainly by no means surprising that these cysts Confusion of these cysts with hydatids. of different orders, which sometimes present the appearance of delicate and pellucid sacs filled with clear and colourless serum, and possess the astonishing power of giving rise to an almost innumerable multitude of cysts presenting the same character with themselves, should, at the first view, have been confounded with true hydatids; but it is no less surprising that a little careful inspection did not at once irrevocably remove the delusion: 1st, Because the bunches Reasons why this error ought not to have been committed. or clusters of secondary cysts are invariably and permanently attached to, and continuous with, the internal surface of the superior cysts in which they are contained; and, 2dly, Because delicate vessels are seen ramifying from the one upon the other.

The cysts which I have been describing as formed on Extravasation of the contents of the secondary cysts. the parietes of the primary cyst at times pour out a part of their contents into the interior of the larger cyst; either, as I have already mentioned, in consequence of an extensive rupture produced by the developement of an inferior order of cysts; or by small apertures, which appear to be likewise the result of distension. In both of these cases, but especially in the latter, the opened cysts bear a considerable resemblance to mucous follicles on a large scale; and appear to be the principal source of the very copious and rapidly produced mucous secretion which is a characteristic feature, in many cases, of ovarian dropsy. This mucus bears a very close resemblance to that furnished by the follicles of Naboth; and is frequently so viscid, that it passes with difficulty through the canula.

The membranes of which these cysts, whether of the Inflammation of the secondary and tertiary cysts. second or third order, are formed, are liable to inflammation. The product of this inflammation, like that of inflammation of the serous membranes naturally belonging to the body, may be either of the plastic or of the inorganizable kind. In the former case, it leads to the formation of adhesions between the close portion of the membrane, or

that which constitutes the contained cluster of cysts, and that portion which is reflected over them, forming the parietes of the containing cyst. It is the formation of these adhesions which so frequently renders it difficult to demonstrate the structure which I have been describing. When the product of inflammation is of the inorganizable kind, we find a secretion more or less puriform in its characters. This secretion is sometimes confined in one or more of the secondary cysts: at other times, it finds a way of escape into the interior of the principal cyst, and thus contributes to the variety in the appearance presented by the fluids drawn off in the operation of paracentesis for the relief of ovarian dropsy. This, however, is not to be regarded as the sole cause of the occasional puriform appearance of the fluid evacuated by this operation. It is doubtless, in some instances, to be attributed to the sort of ulceration or abrasion which I have already noticed as occurring on the internal surface of the principal cyst; and which we find, both in that part which is formed by the cysts developed in its parietes, and in that part of the parietes which happens to be free from them; though it is most frequently met with in the former situation.

Puriform fluid—how produced.

Such are the most striking characters of that form of cysts which, for the reasons already stated, we may regard as affording the type of the second class of adventitious serous membranes. The circumstance upon which I wish to lay particular stress, is, *the production of more or less numerous clusters of cysts, arising from different points, on the interior of the superior cyst.* The cysts composing these contained clusters have neither the narrow necks nor peduncles which mark one of the varieties into which this species of production declines; nor, on the other hand, those broad and extended bases, and that flat and compressed form, which mark the opposite variety, in which the incysted form, and more particularly the disposition to produce a reflected membrane, is less easily made out.

Distinction of the cysts now described, from two other forms.

I shall next describe that variety which is characterized
by slender peduncles. This form presents us with all the gradations, from the form which I have already described, down to the slenderest filaments. I have stated, that it is at particular points on the internal surface of the superior cyst that the clusters of inferior cysts take their origin. It sometimes happens, that the number of cysts forming the cluster is so great, in proportion to the space which they occupy, that, like trees too thickly planted, they interfere with each other's growth. Their developement is more or less limited to an increase of dimension in length; yet, as their free extremities are allowed to diverge, we sometimes find the slender peduncle gradually dilating into a pyriform cyst; at other times, the dilatation does not take place till near the extremity of the peduncle, and it thus produces a cyst more nearly resembling a grape or currant. At other times, no dilatation takes place, probably from the cavity having been wholly obliterated. The pedunculated cysts, or
the extreme of this variety in the form of filaments, are either produced singly, but in the closest approximation, from a particular point of the containing cyst; or they may be attached to it by a common peduncle, from which the proper peduncle of each proceeds. These elongated productions sometimes become highly vascular, and, in the defect of an internal secretion, probably contribute largely to that occupying the sac into which they project. Sometimes, on the
contrary, they are very feebly organized; and appear ultimately to lose their vitality in consequence of the kind of strangulation which they receive at the narrow neck by which they are attached to the containing cyst. It would appear, that the pedunculated cysts and filaments which have thus lost their vitality are a pretty frequent source of irritation to the serous membrane reflected over them, which constitutes the containing cyst. The product of the inflammation thus excited is of the inorganizable kind; and often forms a thick and grumous substance, which sometimes may

be washed out from the bunches of the filaments; but at
other times these come away with it, in the form of shreds.
The bunches of slender pedunculated cysts, and the tufts of
filaments almost resembling tassels, sometimes proceed at
once from the inner surface of the principal cyst; but they
are more frequently met with, growing from the interior of
the secondary cysts.

To render the necessarily-complicated descriptions which
I have now given more intelligible, I shall relate the particu-
lars of two inspections, which afford examples of most of
the peculiarities of those varieties of cysts of which I have
been speaking.

<div style="margin-left:2em">Case to ex-
plain the
slender pe-
dunculated
form of
cysts.</div>

The body of a patient of Dr. Cholmeley, E. Bindle, who
died the preceding evening in Lydia's Ward, was examined
11th of 4th month (April), 1826.

The body was still warm. Emaciation moderate, when
the duration of the complaint and the frequent depletion are
taken into consideration. The abdomen, as in life, was
much distended.

Head not examined.

Thorax.—On both sides, the pleura covering the dia-
phragm, the base of the lungs, and a considerable part of
the lower lobes, bore decided marks of recent inflammation.
There was scarcely a trace of fluid in either cavity; but
flakes of effused lymph, of an opaque yellow colour, of little
tenacity, of unequal thickness, and divisible into laminæ,
but without distinguishable signs of organization, were found
in both, but more remarkably in the left cavity. There
were no marks of more ancient pleuritic inflammation. The
lungs were remarkably healthy, with the exception of those
parts of the lower lobes which corresponded to the most
inflamed portions of pleura, and which were sensibly in-
durated, but without much alteration of colour: the heart
and pericardium were free from disease.

On opening the abdomen, there escaped a considerable
quantity of thick, pale yellow fluid, bearing the strongest

resemblance to pus. The intestines, which were much
distended with gas, were overlaid with this matter; which
seemed to have been poured out over the whole surface of
the peritoneum, excepting on the contiguous surfaces of the
stomach and colon, and a part of the mesentery. Between
some of the convolutions, it was of a more solid consistence,
and offered traces of an approach to the formation of adhe-
sions, but without the tenacity requisite for this purpose.
There were some old peritoneal adhesions between the
liver and diaphragm, as well as between some of the intes-
tines. The omentum was scarcely recognizable: what was
considered to be the relic of part of it, existed in the form
of a long and slender cord, stretched between the left side
of the stomach near to the spleen, and a tumor in the right
inguinal region near the brim of the pelvis. The peri-
toneum lining the parietes was of a grey or even black co-
lour, from carbonaceous matter deposited in its texture,
which was a little thickened. The stomach and intestines
appeared to be free·from disease. The mucous membrane
of the stomach was remarkably pale. The liver and spleen
offered no appearance of disease; but the former was rather
pale.

Connected with the uterus and its appendages were
numerous cysts, closely impacted in the pelvis. They did
not rise above the brim so much as examination before
death would have led one to imagine. The tumor which
had protruded from the vulva had retired within the vagina.
On laying it open, it was found to communicate with a
larger one, situated more internally: both of these, as well
as some other cysts, contained pus: their parietes were
thickened with appearance of erosion. ·Others, whose pa-
rietes were firm and coriaceous, contained a yellow, grumous,
and almost gritty matter. In some, this matter was fluid
from dilution. Some contained a thin and delicately vas-
cular cyst, attached by one part to that which contained it,
and itself containing a bunch of vascular cysts, somewhat

resembling what have been called placental hydatids, floating in serous fluid. In some, instead of bunches of cysts, there were tufts, more or less enlarged, at their free extremities. Some shewed the transition between these cysts containing serum, and the preceding varieties in which suppuration had taken place; and others contained a dark brown, dirty fluid. The uterus was of its natural size and structure. The Fallopian tubes were pervious for scarcely more than half an inch at the interior extremities. The fimbriated extremities, and the ovaries, were indistinguishable in the diseased mass.

Case illustrative of the intermediate form of secondary cysts.

On the 16th of 12th month (Dec.) 1828, I was present at the examination of the body of a female aged rather more than forty years, a patient of Dr. Stroud. — She had been married late in life, and was the mother of one tolerably fine child; but had latterly lived apart from her husband. She became the subject of a tumor in the lower part of the abdomen, which made her appear as large as at the full period of pregnancy. It evidently contained fluid, and was regarded as ovarian. In the course of a few months, it was repeatedly tapped. After each operation, the fluid very rapidly re-accumulated. The fluid was generally, if not invariably, coloured with bright-red or scarlet particles; but appeared to be otherwise much less charged with animal matters than these secretions usually are. It was in no sensible degree ropy, and scarcely any turbidity was produced by the application of heat. The distension of the abdomen was pretty general and equal; and nothing like a defined tumor could be made out, except that, by attempting to grasp a part of the abdomen between the fingers of one hand, and, at the same time, steadily pressing them into the abdomen, two smaller tumors, of about the size of one's fist, might be decidedly, though not very distinctly, felt.

Some days after her last tapping, the fluid having again accumulated in large quantity, the patient rather suddenly expired.

The body was examined, in the presence of Dr. Roget and Dr. Stroud, by W. Skee and myself. About three-fourths of a large pailfull of fluid were withdrawn from the abdomen, by means of a puncture. The greater part of this fluid bore the character already given; but the sanguinolent tinge was not very bright, and did not appear quite equally diffused; some small portions, occasionally passing through the opening, appearing to have a more mucous, and at the same time a more bloody character than the rest. The last portions were of a dirty brown colour, turbid, and rather thick. On enlarging the opening by which the fluid had been evacuated, a cavity of considerable size was discovered; on the internal surface of which there projected numerous tumors of very various sizes, of a lightish colour, but more or less extensively mottled with red. Further prosecution of the examination proved the cavity to be that of a very large cyst; the parietes of which, except when thickened by the before-mentioned tumors, were in general of about the thickness of a crown-piece. They were very extensively and closely applied to the parietes of the abdomen, to which they generally but slightly adhered. It did not appear to have formed any adhesions to the intestines: hence it was readily removed, with the uterus and its appendages. The tumor appeared to have been formed in, and to have dilated the right ovary; at least, there was nothing else discoverable which could be regarded as the ovary. It was also thought that that part of the tumor immediately adjoining to the broad ligament still retained traces of the structure of the ovary. The right Fallopian tube was stretched in a pretty straight line across a part of the tumor. The fimbriated extremity still retained its natural appearance. The left ovary presented nothing remarkable, except that its corresponding Fallopian tube, which was considerably convoluted, was bound down upon it by cellular adhesions, which were partially coloured by matter of a carbonaceous character. The intestines, both internally and externally, appeared healthy.

The liver was small, and seemed somewhat wasted. Nothing
was remarked in the other viscera; but the tumor before
mentioned merits a more minute description. It was pro-
bably capable of containing about two gallons. Its internal
surface presented numerous tumors, yet there was likewise
a considerable extent of smooth lining. The upper part of
the right side, or perhaps it may be said that the right side
generally, was the principal seat of the tumors. The largest
rather exceeded the size of one's fist: two or three were as
large as an egg: several were somewhat smaller; and very
many were, from their small size, more deserving the name
of granulations. The larger tumors were of a nodulous or
irregular tuberose figure: they were mottled and vascular
on the surface; and appeared to consist partly of an opaque,
yellowish white substance, and partly of a more or less clear
fluid. When opened, those which were most completely in
the form of cysts presented other cysts or tumors within
them, over which their own lining membrane was reflected;
but their bases were broad, rather than forming peduncles.
Some of the cysts contained a clear fluid; but in most it
was turbid. In some it was of a light yellow, in others
sanious. The nodulous elevations on the larger cysts were
evidently occasioned by the growth of the contained cysts,
which irregularly distended the containing cyst, the mem-
brane of which was thinnest at these parts. Some of the
tumors were principally composed of a more or less consis-
tent, opaque, whitish substance, which appeared to be per-
fectly insusceptible of organization; but the membranes of
the cysts in which it was contained were vascular. These
cysts were not generally pedunculated, yet in one or two the
radiated structure was indicated. The external surface of
one or more of the tumors appeared to be ulcerated, and
was partially covered by a layer of substance resembling
concrete pus. Besides these tumors, there were on the
internal surface of the large cyst several bright-red highly
vascular fimbriæ, attached by very short narrow necks, and

forming a sort of tassel, or resembling some kinds of sea-
weed. They were of small size, the fimbriæ not being
more than from one-eighth to one-half or three-fourths
of an inch in length. The veins which ramified on the
parent cyst were of a very large size. There was a small
clear cyst on its peritoneal surface.

I shall now proceed to notice that variety, in which the
secondary cysts, so far from being attached by slender pe-
duncles, have that broad attachment and flattened form
which, without the assistance of the intermediate gradations,
could scarcely be referred to the type which I have drawn.
The secondary cysts in this variety, as well as in the two
former, are collected in clusters on the parietes of the
superior cyst; but they appear to produce a circumscribed
and more or less considerable thickening of the parietes,
rather than a prominent tumor, covered by a reflected
membrane. They constitute, however, perfectly shut cavi-
ties; acquire, at times, a considerable size; contain, in some
instances, a serous, and in others a mucous secretion; and
produce in their parietes inferior orders of cysts, having,
like themselves, broad bases and flattened forms. From the
extent of their bases, the secondary cysts in this variety oc-
cupy proportionably a much larger space on the internal
surface of the containing cyst; and, by their developement,
although they increase its size, they seem more completely
to encroach on its particular cavity. In cutting into a
tumor composed of this form of cysts, we may find, it is true,
several cavities of considerable size; but we shall probably
not find the greater part of the fluid collected into one prin-
cipal cavity. Hence, in this variety of ovarian dropsy,
fluctuation is often obscure, and the relief afforded by pa-
racentesis only partial and trifling. I am not aware that
the secondary cysts in this variety ever lose their vitality
from defect of nutrition; but, if such an effect be ever
produced, it cannot be the result of so limited and partial
a cause as that which we have seen to operate in the

3. Flattened and broad-based form of seconda-ry cyst.

preceding variety. There is another point of difference, which consists in the arrangement of the subordinate parts, no less worthy of remark, as distinguishing this variety from the two preceding; that is to say, from the standard and the pedunculated variety. In the two last-mentioned forms, in consequence of the limited extent of the spots whence the secondary productions take their rise, they necessarily acquire somewhat of a radiated arrangement; whereas, in the variety with which we are at present occupied, it is difficult, if not impossible, to reduce its internal structure to any definite arrangement.

Case to illustrate ovarian cysts with broad bases.

In the following case, the form of cyst which I have just described was well marked. The body of Jane Rider, aged about forty, a married woman, affected with incysted dropsy of about two years' standing, which had commenced on the right side, and had produced little derangement of health, was examined 9th of 8th month (August), 1827. The abdomen was greatly distended; and fluctuation might be felt, though obscurely. She had been tapped repeatedly (five times); but the quantity of fluid withdrawn, which was ropy, muciform, and very characteristic, was by no means proportioned to the size of the tumor. She sank rather rapidly after the last repetition of the operation.

The head was not opened.

With the exception of some elongated, filamentous, pleuritic adhesions on the right side, which were arranged along the course of the ribs, the thoracic viscera appeared quite healthy.

On laying open the parietes of the abdomen, the tumor on which the distension of the abdomen depended came into view. It filled the pubic region; and extended above the umbilicus, towards the epigastric region. It was immediately in contact with the parietes. Even the omentum was at the upper and back part of it. Its surface was somewhat uneven; and might be characterized as large, flat, and reniform. It was evidently composed of numerous cysts, the septa

between them being in many parts distinguishable through the general covering. Its peritoneal surface was pretty generally red, and highly vascular. The peritoneum lining the parietes was in the same state, where opposed to the surface of the tumor. In the abdominal cavity there were several ounces of discoloured sanguinolent fluid, apparently mixed with some of the mucus from the cysts. There was nothing like the formation of recent false membrane accompanying these appearances of inflammation. The old adhesions which the tumor had contracted were very limited, when compared to the extent of the surface. They were almost, if not wholly, confined to the iliac regions, and to the upper part of the right side. The tumor appeared to have taken its origin in or near the left ovary. The uterus, which was about its natural size, was carried considerably to the right. Its left side was rather elongated, and the Fallopian tube and round ligament even drawn out by the tumor over which they were stretched. The right ovary was slightly enlarged, mammellated, and very vascular. The tumor, when cut into, was found not to consist, as is often the case, of one principal cyst; but was made up of a very considerable number of a moderate size, containing a mucous secretion of various degrees of thickness and transparency, which in a few of the cysts was much discoloured. In the parietes of all the principal cysts were developed innumerable small cysts, not pedunculated.

The mucous membrane of the stomach was, in some parts towards the cardiac extremity, of a brownish colour, and was easily separated from the subjacent coats : that of the duodenum was of rather a leaden hue. In other respects, the abdominal viscera were tolerably healthy.

Although we may observe the three well-marked forms which I have now described in ovarian serous cysts of the second class, and though for the most part each individual case more particularly affects one or other of these forms, yet it sometimes happens that two, or all three, may be

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found in the same superior cyst. Even then, however, one form seems to predominate.

Causes of the production of ovarian cysts.

There appears to be an hereditary disposition in some females to the production of the serous ovarian cysts. Even in these cases they are mostly unaccompanied with any constitutional taint; that is to say, other parts of the body are not simultaneously affected with similar productions. It is even more common for one ovary to be singly affected, than for both to give origin to this form of cysts: nevertheless, it does sometimes happen, that we meet with cases of double ovarian dropsy; but in many, if not in most of these, there is likewise a complication with some one of the diseases commonly called malignant, of which I am shortly to speak. It is by no means easy to say what are the exciting causes of this form of ovarian dropsy. Though, in many instances, the patients refer the commencement of the disease to parturition, yet it is far from being uncommon for unmarried or barren women to labour under this affection. The tumors and growths allied to ovarian dropsy, to which I shall presently call your attention, as formed in other parts of the body, can often be referred to some mechanical injury; but, in the case of organs which appear to be so well protected as the ovaries, it is more difficult to conceive of the possibility of such an exciting cause. Something may possibly be ascribed to the natural and periodical changes which these organs, in common with other parts of the female genital system, doubtless undergo. The escape of vesicles, which may take place in virgins, is necessarily attended with a degree of lesion which may be the exciting cause. I have already stated my objections to regarding these tumors as degenerations of the vesicles of De Graef.

Large size of the compound cysts formed about the uterus—how accounted for.

Another circumstance which deserves some consideration and inquiry, is the larger size and greater abundance of the contents of the cysts formed in and about the ovaries, than those of similar cysts formed in other parts of the

body. Two or three causes, I presume, mainly contribute to this result. The first which I shall mention, is the obvious fact, that the system, on which, in the case of ovarian dropsy, the cysts are implanted, is naturally disposed to obey a stimulus which requires an increased supply of nutritive matter, and which gives rise to a proportionally rapid growth. In the next place may be mentioned, the abundant supply of blood which these parts habitually receive: and thirdly, and, as I believe, principally, must be noticed the position of these parts, situated in the abdomen, and consequently exempt from all pressure or restraint calculated to limit their developement.

This last point appears to merit an additional attention, from the suggestions which it excites in relation to the operation of paracentesis for the relief of this form of dropsy. So long as the distress and inconvenience of the patient will allow us to defer the operation of paracentesis, it is, doubtless, desirable to do so; since even the pressure which the full sac itself is able to exert on its contents must have a tendency both to diminish the rapidity of secretion, and to retard the growth of the inferior order of cysts. It is well known, that the oftener the operation has been performed, the shorter is the interval which elapses before a repetition is required; and at last, a quantity is produced in the course of a very few weeks, as large, if not larger, than that which had been many months in accumulating, prior to the first operation.

Therapeutic indications dependent on locality.

The next and last point of which I shall speak, in connection with ovarian cysts, is the degree of irritation which they occasion in the surrounding parts. This irritation is generally, in the early stages at least, remarkably slight: indeed, it is very probable that it can scarcely be said to exist, until some of the causes have been brought into action, which I formerly described as producing inflammation, or death of a part or parts of the adventitious growth. I have frequently been astonished at the comparatively

Irritation of the contiguous parts occasioned by ovarian cysts.

slight and recent peritoneal adhesions by which some of
the largest ovarian cysts have been attached to the neigh-
bouring organs.   This circumstance is not only a striking
feature of difference between this affection and others
closely allied to it in structure, but it is of the utmost prac-
tical importance with reference to the only mode of treat-
ment hitherto devised, which is at all adequate to the cure

Extirpation of the ovary. of the disease — I mean, the absolute extirpation of the
affected organ.   Though this must necessarily ever be a
most dangerous and formidable operation, I can see no
insuperable obstacle to its practicability, provided it be
performed at an early stage of the complaint.   Of course,
it must be desirable, when any idea is entertained of per-
forming this operation, to abstain from paracentesis, or any
other measure which may have a tendency to produce ad-
hesions between the external surface of the principal cyst
and the parietes of the abdomen.

Compound serous cysts in the testis. Adventitious serous cysts assuming the form of reflected
membranes are also met with in the male organ corre-
sponding to the ovary; that is to say, in the testicle, where
they constitute that affection which has been designated, by
some, hydatid testicle.   After what I have already said
respecting the confusion of serous cysts with true hydatids,
which are sometimes found in the testicle, it is needless
that I should again point out the decided characters which
distinguish these two forms of cysts.   The serous cysts
which are developed in the testicle are very far from at-
taining the size of those which are produced in the ovaries;
yet at times they distend the testicle to a larger size than
it acquires under any other disease—fungus hæmatodes,
perhaps, alone excepted.   Like the affection of the ovary, of
which we have been speaking, this encysted disease of the
testicle appears to be unaccompanied by any constitutional
taint; and when the affected organ has been removed, the
patient has not been troubled by any return of the com-
plaint.   This disease is much more rare than the corre-

sponding disease in the female; and I am not aware that
any observations have been collected which tend in the
least to shew that there is any thing like an hereditary pre-
disposition to this affection.   It seems probable, that in
some countries it is endemic; and if we have been correctly
informed by navigators, the inhabitants of the Isle of Tin-
nian appear to be much subject to it.   It is stated, that
very many of the inhabitants of this island are affected with
enlarged testicle; and that extirpation, which is said to be
sometimes performed by the patient himself, is employed
for the cure.   The disease is not mentioned as of that
serious character which would warrant us in supposing it
to have been of what is called a malignant nature.   In the
encysted disease of the testicle, the fluid bears so much less
a proportion to the solid parts than is the case with the
encysted disease of the ovary, that it affords an easy trans-
ition to those tumors, which, though for the major part
solid, nevertheless affect the structure and bear the closest
resemblance to, if they are not absolutely identical with the
compound serous cysts, the formation of which I have been
describing.   In fact, the difference between them, so far as
the proportion between the fluid and solid parts is con-
cerned, appears, as I have already hinted, to be very much
influenced by the degree of pressure to which the exterior
of the adventitious growth is subjected.

There are two other situations in which the class of ad-
ventitious serous membranes, with which we are now occu-
pied, is occasionally found; and respecting which, from the
predominance of the fluid parts in the cysts, it may be pro-
per for me to say a few words, before I proceed to the con-
sideration of those growths which, from the predominance
of the solid parts, are more commonly styled tumors.

The female mamma, and its immediate neighbourhood,
are occasionally the seats of the adventitious formation of
serous cysts assuming the form of reflected membranes.
They bear the closest resemblance to those which I have

already mentioned as occurring in the testicle, and have, in
consequence, with equal inaccuracy, given rise to the appel-
lation of ' hydatid breasts.'   The cysts formed in a breast
thus affected contain bunches of secondary cysts, and a fluid
sometimes serous, sometimes very nearly resembling syno-
via, and at other times of a mucous character.   This affec-
tion does not appear to be accompanied by any constitu-
tional taint, or to be at all malignant in its nature, the dis-
ease being wholly removed by the removal of the part.   I
shall not dwell longer on this form of disease; since these
cysts are generally accompanied by others, which give rise
to a more solid structure.

Compound   Bunches of cysts are occasionally formed in the eye.
serous
cysts in the They are more interesting, from the importance of the
eye.   organ which they affect, and from their situation, so re-
markably favourable for the inspection of their progress,
than from the size to which they attain.   They cannot, how-
ever, fail to excite very serious apprehension; since, in their
commencement, it must be difficult, or even impossible, to
distinguish them from the commencement of a malignant
disease.   Though they should not present this character,
and therefore not endanger the life of the patient, they will
at times completely deprive him of the use of the affected
eye.   The production of these cysts in the eye may be
sometimes clearly traced to external violence: at other
times, the exciting cause is more obscure.   There was, some
time since, a patient in the London Ophthalmic Infirmary, in
the anterior part of whose eye two or three serous cysts had
formed, in consequence of a small penetrating wound which
he received through the cornea.   For some time they con-
tinued to sprout, notwithstanding the operation which had
been performed for their removal: but I have been since
informed that the apprehensions entertained respecting this
lad have proved groundless, and that the eye was returning
to its former integrity.   A case, which I take to be similar,
was related some years ago to the Medico-Chirurgical

Society :—A small circular body, resembling a cyst, was seen
floating in the anterior chamber of the eye, and attached by
a slender peduncle to a part of its parietes.   It was con-
sidered to be an hydatid : an operation was performed for
its removal, and I rather think that complete success was
obtained.   Though this case was regarded as one of hyda-
tids, it appears to me to be sufficiently evident that the
little pedunculated body which excited so much interest
belonged rather to the class of adventitious serous mem-
branes.   One of the forms of staphyloma, which is regarded
as in no degree malignant, appears to be essentially composed
of a collection of cysts ; and, as far as I can judge from
mere description, having never had an opportunity of
examining a case of the kind myself, is connected with that
form of adventitious serous membrane with which we are
now occupied.

248

LECTURE IX.

ON THE

GENERAL CHARACTERS OF MALIGNANT DISEASE.

GENERAL CHARACTERS OF MALIGNANT DISEASE.—MEANING OF THE TERM
' HETEROLOGUE ' — FOUR DIVISIONS OF HETEROLOGUE FORMATIONS—ALL
MALIGNANT GROWTHS HAVE SOME CHARACTERS IN COMMON—APPEARANCES
PRESENTED ON MAKING SECTIONS OF MALIGNANT TUMORS—APPEARANCES
BROUGHT INTO VIEW BY A CAREFUL DISSECTION—EXTERNAL CONDENSED
CELLULAR MEMBRANE—INTERNALLY, A SEROUS MEMBRANE WITH REFLEC-
TIONS OVER PEDUNCULATED BODIES—FORMATION OF SEPTA—GROWTH OF
SECONDARY CYSTS, AND CONSEQUENCES OF THAT GROWTH — DEATH OF
SECONDARY CYSTS, AND EFFECTS PRODUCED BY IT.—FORMATION OF AN
ULCER EXTERNALLY—CHARACTER, MODE OF PRODUCTION, AND STRUCTURE
OF THIS ULCER.—ON THE FLUID PORTIONS OF MALIGNANT GROWTHS—ON
THE SOLID PORTIONS—SOURCE FROM WHICH THE SOLID PARTS ARE PRO-
DUCED — EFFECTS OF MALIGNANT GROWTHS ON SURROUNDING PARTS —
INFLUENCE IS EXERTED ON THE CHARACTER OF A NEW DEPOSIT BY THE
CHARACTER OF THE PART IN WHICH IT IS DEPOSITED—APPLICATION OF
THIS PRINCIPLE TO MALIGNANT DISEASE, WITH ILLUSTRATIONS—DISCUS-
SION OF THE QUESTION, WHAT IS MALIGNANT DISEASE ?—CHARACTERISTICS
OF MALIGNANT DISEASE — INADEQUACY OF THESE CHARACTERISTICS —
SUMMARY OF THE MOST SATISFACTORY GROUNDS ON WHICH TO FORM
DIAGNOSIS—LIABILITY OF CERTAIN STRUCTURES TO MALIGNANT DISEASE—
—CONNECTION BETWEEN A LOW DEGREE OF VITALITY AND THIS LIABILITY
—ON THE DEGREE OF INNERVATION, AS CONNECTED WITH THIS LIABILITY—
LIABILITY OF FIBROUS TISSUE AND NON-MALIGNANT TUMORS TO BECOME
THE SEAT OF MALIGNANT GROWTHS—INFLUENCE OF JUXTA-POSITION.

GENTLEMEN,

I HAVE now to solicit your particular attention to the
different forms of heterologue deposits; which may be re-
ferred to the general laws of formation unfolded to you in
my last Lecture, when speaking of ovarian dropsy. Allow
me to remind you of that part of the arrangement adopted
in my introductory Lecture, which relates to adventitious
deposits. I remarked, that most of these accidental forma-
tions have been called heterologue, to denote their dissimi-

LECTURE IX.

larity from those structures which naturally exist in the
body. They are marked by a certain degree of uniformity
of character, and more particularly by their mode of forma-
tion. Most of them have been styled malignant; and they
may be reduced under the four following heads. The first
comprises those cases which consist in the production of
well-formed cysts, generally assuming the character of
reflected membranes, unaccompanied by constitutional taint,
and commonly called hydatids. These may be considered
as typical of the order at the head of which they are placed;
and I have already detailed their most striking characters.
The second division comprehends true scirrhus : yet it
must be confessed, that it is very difficult to say, in all cases,
whether this term is applicable or not, since the natural
boundaries are most indistinctly marked between this and
some other members of the family. The third division
comprises fungus hæmatodes, fungus medullaris, medullary
sarcoma, fungoid disease, spungoid inflammation, cerebri-
form cancer, &c. The fourth division comprises melanosis
in that particular form which exhibits a structure resembling
the preceding classes. The term ' melanosis,' as descriptive
of a particular specific affection, has been, by some, re-
stricted to growths possessing a certain anatomical struc-
ture. To these may be added cirrhosis, and gelatinous or
gum cancer.

Laennec has remarked, that the older surgeons, and, in
imitation of them, the modern anatomists, have confounded,
under the name of cancer, scirrhus, and carcinoma, acci-
dental productions, which have no common characters, ex-
cept either their having no analogy to the structures natu-
rally existing in the body, or their being produced in a state
of firmness or crudity, and tending to destruction by a pro-
cess of softening. I am very far from wishing to set aside
the discrimination between the different forms of malig-
nant diseases. We owe much to Laennec, for the distinction
which he powerfully contributed to introduce. At the same

Division of
adventitious
growths
into four
classes.

1. Adven-
titious cysts.

2. Scirrhus.

3. Fungoid
disease.

4. Melano-
sis.

Various
meanings of
the terms
' scirrhus,'
' carcinoma,'
&c.

time, I am persuaded that there are certain points of
resemblance, by which the affections known by the different
names which I have enumerated are most intimately and,
as a family, inseparably connected together. These common
points of resemblance, which are chiefly dependent on
structure, and appear to have been very much overlooked,
not only by Laennec but by many others, constitute the
characters which I shall endeavour in the first place to
point out. Having explained these, I shall proceed to
notice what I conceive to be the structural and other pecu-
liarities of each division : and I shall take a cursory review
of some of the opinions and doctrines which have been ad-
vanced on this subject.

Charac'ers
of malignant
tumors.

The tumors of the description of which I am now speak-
ing have a more or less rounded form. On making a section
of them, they present various appearances; but are all more
or less divided by septa, which affect sometimes a radiated
form, and at others a cellular character. Both of these
characters have been insisted on by many writers on this
subject; but I believe the differences which have been ob-
served, depend, in many instances, on the direction in which

Common
errors in the
mode of
examining
malignant
tumors.

the sections are made. The mode of examination by means
of section, if it be the only one employed, is not better
adapted for the investigation of these tumors, than for that
of the brain. The objection to it is increased by the plan
of immersing the specimen in alcohol, which is sometimes
had recourse to for the purpose of hardening the parts. By
this measure, we coagulate the fluids, render opaque the
transparent parts, and consequently, by masking the boun-
daries of structure and arrangement, destroy two of the
most important characters which assist the examination.
It is on this account that almost all the preparations which
I have made myself, or seen made by others, are more or
less unsatisfactory, and, even in the most successful cases,
fall incomparably short of the inspection of the recent spe-
cimen.

If we carefully dissect down to the surface of one of these
tumors, we shall usually find that it has a capsule or cover-
ing; which has, I believe, generally been supposed to consist
of the altered and condensed cellular membrane of the
parts which have given way before the growth of the tumor.
This idea is probably correct with respect to the unequally-
thickened external part of the capsule : but if we select those
tumors in which the process of decay has either not com-
menced or has made very little progress, we shall find, on
a careful dissection, that the surface which is next to the
mass of the tumor is more or less smooth and even; and
on raising it, we find that it is reflected over one or more
somewhat pyriform bodies, attached by a base, which is
generally narrow and peduncular, to some part of the cir-
cumference of the enclosing capsule.   Unless the tumor be
very small, it is much more common to find several, rather
than a single body of this kind; and, as there is often little
if any fluid intervening between them and the enclosing
capsule, their form is somewhat modified by their mutual
pressure.   Sometimes, though more or less closely applied
to each other, these pedunculated bodies are perfectly de-
tached at their sides, and may, consequently, be readily
traced to the point which forms the common origin of their
peduncles.   At other times, these bodies are so adherent
amongst themselves, and the membrane covering them so
tender and delicate, that, without very great care, the ar-
rangement of their structure may be overlooked, in conse-
quence of the pedunculated bodies being broken or torn
through, in a different direction from that to which their
mode of formation would naturally dispose them.

It must be sufficiently obvious, that the appearance pre-
sented by the section of a tumor such as I have just de-
scribed must be very materially affected by the direction in
which the section is made.   If it pass through or near to
the point at which the pyriform bodies are attached to the
enclosing cyst, it must more or less nearly correspond

with the direction which some of these bodies take towards
the circumference; and their edges will consequently be
seen, in the form of radiating lines. On the other hand, if
the section be made more or less nearly transverse to the
axes of these bodies, their sections will convey the idea of
cells of various shapes.

Continu-
ance of the
dissection.
    If, continuing the dissection, we raise the outer cyst, or
the membrane reflected from that which covers the radiating
pedunculated bodies, we shall generally find, that on one
or more sides it dips down deeply into the mass of the
Formation
of septa.
tumor. It thus forms part of a septum, which separates one
packet of pedunculated bodies from the others, which usually
concur to form the mass of the tumor ; for it, comparatively,
rarely happens that the tumor is composed of a single cyst
filled with pedunculated bodies. On examining these dif-
ferent encysted packets of pedunculated bodies, we shall
often find some indication of their having taken their origin
from nearly the same spot, which is generally the most in-
durated part of the tumor.

    We may likewise observe, that the different secondary
tumors or encysted bundles of pedunculated bodies are
Rupture of
the original
cyst by the
growth of
the inferior
cysts.
in very different stages of progress. In those tumors
in which the internal growth is most active, we shall
find that a process has taken place perfectly similar to
that which I described as occurring in ovarian tumor,
when the developement of the contained cysts produces
the hernia or rupture of the containing one. The se-
condary cyst, or cysts, which make their way through the
containing one, rapidly advance when they are freed from
the restraint which its pressure afforded, and thus constitute
another tumor, which adds to the original mass. If we
examine the structure of this new tumor, we shall find that
the subordinate growths of which it is composed, radiate
from the point at which this tumor made its escape from
the original one. At the same time that the escaped cyst
or cysts acquire their more rapid growth, they often assume

a new character with respect to their consistence, which is generally much more soft and tender. The most striking illustrations of this principle are met with in osteo-sarco-matous tumors, which very decidedly belong to the class of which I am now speaking. Whilst that portion, which con-stitutes the original part of the tumor, and has been formed beneath the pressure of the periosteum, is dense, and more or less loaded with bony matter, that portion which has grown through the openings presented by the distended fibrous tissue is of luxuriant and rapid growth, and is almost wholly composed of soft matter. Those parts of the tumors in which the rapid and unrestrained growth is most remark-able are generally situated near the circumference, where they are exempt from the restraint of mutual pressure, and receive an abundant supply of nourishment from the sur-rounding natural structures.

A marked difference exists between malignant formations under such circumstances, and others in which develope-ment has been restrained or vitality lost by pressure, and, consequently, a defective supply of nutrient matter. I have already explained to you the mode in which pressure, im-peded nutrition, and death, are occasioned in those ovarian tumors in which the secondary cysts are thickly crowded, and attached by very narrow peduncles. Precisely the same process takes place in the tumors of which I am now speak-ing: and when we make a section through one of them which happens to be composed of many secondary tumors, and which consequently presents many centres of radiation, we shall often find that the pedunculated bodies connected with one or more of these centres have lost their vitality by a natural strangulation or ligature; and, also, that the immediately adjoining parts which yet retain their vitality, irritated by that which has now acquired the character of a foreign body, are brought into a state of inflammation. The result of this compound action is the formation of a cavity filled with broken-down and softened matter of a

Hence a pu-
rulent depôt
is formed:
in other
words, there
is central
softening.

peculiar character, intermediate between suppuration and
gangrene. This process very frequently takes place before
the exterior of the tumor exhibits any symptom of irritation
or inflammation, and, to my mind, very satisfactorily ac-
counts for that disposition to central softening or decay
on which Laennec, Wardrop, and some others, have so
forcibly insisted, as characterizing the progress of hetero-

Conditions
essential to
this central
softening.

logue deposits. At the same time, I think I am correct in
stating, that, for the production of this form of gangrene
or softening, the supply of nourishment should be pretty
promptly cut off by the operation of the natural ligature.
When the process proceeds more slowly, the parts which are
under its influence gradually acquire an increasingly dense
structure, and, ultimately becoming penetrated by earthy
matter, are allowed to remain, unproductive of serious ir-
ritation, notwithstanding their deteriorated organization
and diminished supply of nourishment. Striking examples
of this process are met with in the scirrhous tubercles de-
veloped in the uterus; and I have likewise seen it in the
liver.

Effects of
malignant
tumors on
the sur-
rounding
textures.

Tumors, such as I have described in the course of their
developement, produce, by the irritation which they excite,
a greater or less degree of thickening of the surrounding
cellular structure, and sooner or later become visible exter-
nally, dilating the integuments which are stretched over
them. The points, at which this distension is the most con-

Production
of an ulcer
externally.

siderable, are inflamed. The inflammation proceeds to
ulceration; and the tumor either sprouts luxuriantly at the
part from which the pressure is thus removed, or participates
in the ulcerative process; which latter event, for reasons
presently to be explained, is that which we have most fre-
quent occasion to observe. The ulcer, the production of
which I have described, is worthy of special attention;
and has been particularly insisted upon, as peculiarly cha-

Character
of this ulcer.

racteristic of malignant disease. It is universally described
as presenting elevated and everted edges; whilst its ragged

and depressed central portion is bathed by an unhealthy secretion, to which the name of pus can scarcely be applied.

The mechanism by which this peculiar ulcer is produced, is as follows. I have shewn that, at the external part of the tumor, its growth is the most luxuriant, both from the want of pressure, and from the increased supply of nourishment. The continued developement and growth of the adventitious structure at the circumference, especially when the skin participates in the affection, will explain why this part of the ulcerated surface is the most elevated. The central parts, on the other hand, have not only to encounter the pressure which they sustain from the surrounding parts of the tumor, and to suffer the diminished supply of nourishment which this pressure occasions, but, moreover, ulceration, having removed the integuments, all supply of nourishment from the surrounding natural structures is necessarily cut off. The depth and irregularity of the central part of the ulcer is often further promoted by a communication being formed between this part of the ulcer and a cavity commenced and produced in the interior of the tumor, by the process which I have heretofore described. We may be easily convinced of the general accuracy of the description, which I have endeavoured to render intelligible, by making a section through a recent specimen of an ulcerated tumor of the kind now under our notice, in such a manner that the section may pass through the diameter of the ulcer. By then carefully dissecting the cut edge of the ulcer, we may almost always find satisfactory evidence that the elevated margin is composed of radiating pedunculated bodies; whilst in the centre, this disposition is less distinct, the structure much more condensed, and there is little, if any, trace of organization; excepting at a few spots, in which inflammation appears to have been set up by the irritation caused by the neighbouring dead parts.

Such, Gentlemen, do I believe to be a correct account of the structure of those tumors, to which the term

'malignant' has been applied. The type of all these forma-
tions may be seen in the pericardium, or tunica vaginalis :
and if you trace out the various modifications of which the
simple form of a lining membrane with a reflected portion
is susceptible, you will have no difficulty in comprehending
the anatomy of malignant growths.

There yet remain a few remarks for me to offer respect-
ing these tumors generally, before I proceed to speak of
their different species.

1. With respect to the more fluid parts of these tumors.—
Although these generally bear a very small proportion to
the solid part, we shall almost always find some fluid pre-
sent; which, on close inspection, is seen to be either con-
tained in cells of various sizes, or lodged between the
pedunculated bodies and the membrane reflected over
them. This fluid is by no means uniform in its appear-
ance and qualities. In that form of tumor which I have
taken as the type—in which the encysted structure is the
most evident—in which the surrounding parts are the least
altered—and in which there appears to be no constitutional
taint, the fluid is most abundant, and, more frequently than
in the other forms, presents a serous character; but even
in this form we find it passing through various degrees of
ropiness, in some of which it very closely resembles synovia,
until we arrive at the form of thick and perfect mucus.
In some cases it is colourless and transparent; but it is
also met with of a yellow colour, as if tinged with bile.
Sometimes it is streaked or spotted with blood, and occa-
sionally it is intimately mixed with blood or cruor. Most
of these appearances may be met with before the contained
cysts or pedunculated bodies have lost their vitality; yet
the last-mentioned appearance, or that in which the fluid
is soiled by cruor, is most likely to occur when this change
has taken place. At other times, the fluid contained in
those cells in which the inferior cysts or filaments have lost
their vitality is yellow, opaque, and puriform, or grumous.

In those tumors which present a very dense structure, bearing a considerable resemblance to cartilage, the fluid which may be observed to exude from those parts of the incised surface at which the vitality of the structure has not been lost, before the removal of the tumor or the death of the subject, is, I believe, invariably of a viscid, mucous character. I wish you to keep this observation in mind, as I shall hereafter have occasion to advert to it. In the present instance it deserves notice, as forming one of the features of resemblance between the tumors with which we are now occupied, and those more manifest serous cysts with the description of which I commenced. I may add, as another point of analogy, that in these dense tumors we often observe small, scattered, yellow, opake points, presenting the same character with those already described as occurring on a larger scale, where vitality has been lost by strangulation.

Secondly, the differences observable in the solid part of these tumors merit particular attention; since it is on them that the distinctions drawn by pathologists have been principally founded. We find the solid structure presenting every gradation, from an almost stony hardness, to the consistence of the brain of a child, or of weak size. It is not, however, in the degrees of consistency that the only difference exists: there are likewise differences of structure, which appear to depend partly on the mode in which the contents of the cyst have been thrown out, and partly on the susceptibility of organization possessed by the matter effused. In those cases in which the structure on which I have insisted is the most evident, the subordinate pedunculated bodies are well defined; and each is enclosed in a peculiar membrane, although these membranes may be adherent amongst themselves. Collectively, they entirely fill the sac which is reflected over them. They are seen to take their origin from one particular part; and their small, thickened, and feebly-organized membranes principally

[marginal note:] On the solid part of malignant tumors.

[marginal note:] Differences between the solid parts: and causes of such difference.

S

constitute the solid part of the tumor. At other times,
instead of a bunch of numerous small cysts or pedunculated
bodies, the enclosing cyst or reflected membrane, as I have
already said, contains very few bodies, or even a single one,
of this kind; which, if examined at an early period of its
formation, will be seen to bear a close resemblance to some
forms of polypi, and to be nearly or quite transparent, but
of an amber or sanguineous colour. It appears to consist
of tender coagulable lymph, which at times admits of the
elongation of vessels into its substance. These vessels ra-
mify, in a radiating form, from the point to which the pe-
duncle is attached; but they seem incompetent to maintain
the vitality of the structure in which they are distributed.

Differences
of colour;
and expla-
nation
thereof.

This structure, as its degree of vitality is lowered, becomes
opake. It is white, and resembles the medullary structure
of the brain, if the small vessels of which I have been speak-
ing do not give way; but when they do give way, the blood
which they effuse, pervades the opake matter, and more
or less deeply discolours it. I have never met with the
last-described appearances, except in tumors of rapid growth,
dependent on fungus hæmatodes or medullaris. I am in-
duced to lay some stress upon them; since they appear to me
to explain our being sometimes able both to inject large
masses of fungoid matter, and, if they yet retain some de-
gree of translucence, to detect, even without injection, a
few vessels passing through their substance. I think,
moreover, that they tend to reconcile the conflicting opi-
nions which have been advanced respecting the organizi-
bility of fungoid matter.

Sometimes
the solid
parts seem
secreted
from the
lining mem-
brane.

Sometimes the more or less solid matter appears to con-
sist of a secretion from the internal surface of the membrane
generally, rather than of a growth protruded into its cavity
from a particular part of its circumference. In this form,
we occasionally meet with a laminated structure, such as is
observed in an aneurismal clot. I am not aware that it
ever exhibits the slightest indication of organization; though

it not unfrequently becomes infiltrated with extravasated blood. This form, like the preceding, is principally, if not solely, met with in fungoid disease.

Some tumors, which are of an almost gristly hardness, and acquire a considerable size before they pass into the stage of softening or ulceration, appear to be formed on the type of those ovarian tumors which are composed of cysts with broad bases. In these, the radiating structure is but little observable. .

I have seen, in examining cysts, where the structure which I have repeatedly endeavoured to explain was unequivocally present, appearances which are worthy of observation, and which, perhaps, I cannot better introduce than in this place ; though it is not easy to say, whether they belong most to the fluid or to the solid part of the structure. The cysts of which I am speaking, contained a substance which may perhaps be best described by comparing it to the crystalline lens, when it has been in some degree softened by decomposition ; though rather less uniform than it, both in consistence and appearance. That part which was the nearest to the containing cyst was the least firm and consistent, but the most transparent. It was too transparent and colourless to conceal the firmer interior part, which was rendered distinguishable by a slight degree of opacity, and appeared to consist of a cluster of small pyriform grains ; but nothing like a membrane could be distinguished, enclosing them individually, and separating them from the transparent matter in which they were placed. They appeared to be nascent pedunculated bodies, of which the surface had not, as yet, become a concrete texture. This observation appears to possess a two-fold interest. In the first place, it will enable us to conceive how easily the traces of original structure may be lost, when we find them impressed on so tender a material, and which is in contact with a material of almost identical composition. Secondly, we may draw from it a strong presumption, that the cysts of which we have been

speaking, however various may be the forms in which they present themselves, are altogether new formations, and not the result of the extension or developement of pre-existing structures. This deduction tends to confirm the opinion which I have already advocated, that these cysts are neither the dilated terminations of the extreme branches of any of the three vascular systems, nor modifications of the cells of the cellular membrane.

Such are the principal points of variety which I have thought it necessary to lay before you, with regard both to the fluid and solid matter of the tumor, which consists essentially of a new and adventitious structure, and not of the degeneration of structures natural to the body. I have next to notice the changes which the normal structures undergo, in the immediate vicinity of that which is adventitious. Those tumors which consist of well-formed, adventitious, serous cysts of the second class, such as those which have been termed hydatid disease of the testicle or mamma, and in conjunction with which there appears to exist no constitutional taint, produce in their neighbourhood some thickening and condensation of the cellular membrane; but even this is seldom very considerable, and the muscular and other structures appear to undergo no other alteration than that which may be referred to pressure or distension.

The case is different with respect to other tumors of this class, in which the essential form of an adventitious serous membrane of the second kind is complicated with the effusion or secretion of a material which, though possessed of certain points of resemblance, appears to differ from any thing that is produced by the natural structures of the body in their healthy state. It seems pretty evident, that, in the disturbed, if not in the healthy process of nutrition, a new product, whatever may be its character, is influenced by the nature of the surrounding parts. As this is an important point, which I wish you not

Changes produced by these tumors on surrounding parts.

1. Where the disease is not malignant.

2. Where the disease is malignant.

The character of a new product is influenced by the character of surrounding parts.

to take barely on my word, or solely on the authority of
cases relating immediately to the subject before us, I will
endeavour to illustrate it by one or two independent ex-
amples. The first instance which occurs to me, is in the
case of masses of bony matter deposited in the condensed
cellular structure, resulting from a chronic ulcer situated
over bone. In one example, which I have particularly
in view, the ulcer occupied the neighbourhood of the tro-
chanter major, and the masses were formed in the imme-
diate vicinity of the bone, but were nevertheless perfectly
detached from it. The numerous instances which we see
of ossification at the origins or insertions of muscles are
probably referrible to the same principle; although it must
be admitted, that these examples are not unexceptionable,
since in them we have a continuity of structure. I need
scarcely remind you of the fact which I have already re-
lated to you in one of my former Lectures, that inflamma-
tion of a serous membrane, tending to the production of an
inorganizable deposit on the smooth surface, is frequently
accompanied by a similar production on the attached sur-
face. As a further illustration, it may be noticed, that, after
the fracture of a bone, the process by which the new bony
matter necessary for union is produced, is often morbidly
carried on in the matter which inflammation has deposited
in the surrounding structures.

I shall not take up your time by adducing further illus-
trations of this principle; but proceed to mention those
cases which more immediately belong to the subject before
us. They are, in fact, the most striking that can be brought
forward; probably from the circumstance, that the hetero-
logue structures are more readily produced accidentally
than the analogue.

Although I have directed your attention to this princi-
ple, as one of much interest and importance, and well
worthy of your investigation, I wish it at the same time to
be expressly understood, that I very fully admit the opera-

tion of many other causes, which appear to perform at least
as important a part in modifying the function of nutri-
tion, and consequently in determining the nature of its
Application
of this prin-
ciple to ma-
lignant dis-
eases. product. It is however, as I apprehend, mainly on this
principle that we are to explain the fact, that the natural
structures in the neighbourhood of malignant tumors are
so apt to degenerate into a substance in some respects re-
Proofs of
the justice
of these ap-
plications. sembling that of the original tumor. Thus, in the neigh-
bourhood of those tumors which are of slow growth and
of cartilaginous hardness, we often find the surrounding
structures, but more especially the cellular membrane, par-
taking of the same character of hardness, though necessa-
rily wanting that structural arrangement which charac-
terizes the tumor itself. In the same way, we find that those
tumors in which the arrangement described has been given
to a soft and almost brain-like substance are surrounded by
natural structures, which degeneration has converted into a
nearly similar substance, or which have a similar matter de-
posited interstitially. Again, in those tumors which are
remarkable for their black colour, and to which the name
of ' melanosis' has, from this circumstance, been applied,
the surrounding structures become more or less deeply
tinged with a black or carbonaceous material. This dis-
ease also presents us with a good illustration of the princi-
ple, but in a mode precisely the converse of the preceding
example. There is, perhaps, no organ so liable to be af-
fected with melanosis as the eye ; and I cannot help strongly
suspecting that it is the natural and healthy production of
black pigment performed by the choroid coat of this organ
Circum-
stances
under which
these
changes
occur. which is the chief cause of this predisposition. It appears
that these changes in the natural structures surrounding
the tumors of which we are speaking, do not take place
until some cause connected with the presence of the tumor
has produced in them either absolute inflammation, or a de-
gree of irritation almost amounting to it. It is on the
nature of the engorgement or effusion to which this irrita-

tion gives rise, that the nature of the alteration in the
natural structures depends.

On reverting to the different causes of variety, which I
have now enumerated, as affecting the general arrangement
of the structure of the tumor, the character and proportion
of its fluid and solid parts — and the appearances exhi-
bited by the adjacent structures, which are often confounded
with the tumors itself—you will at once see that there is
abundant reason, both for the want of uniformity in these
growths—which may, notwithstanding, be referred to one
and the same type—and for the very great variety in the
opinions entertained by pathologists, respecting their ap-
pearances, structure, and nature.   There are, however, still
other causes, which contribute to the variety and obscurity
to which I have alluded.   Amongst the most fruitful of
these, are the differences in the original structure in which
the new growth has taken its origin.   Thus, when the new
growth is so situated as to be intimately involved in the
muscular fibre, the combined effect of their pressure and
motion has a strong tendency to obscure its peculiar and
essential structure.   But, although its form is thus altered,
and its structure in some instances is made to approach the
character of elastic ligaments, I have never yet failed to
detect, in some part or other of the new growth, indications
sufficiently conclusive to convince me that, even in these
instances, the type which I have explained is still observed.

As the question of malignity or non-malignity is almost
constantly agitated with reference to individual tumors, it
becomes a matter of considerable importance to define
exactly what is meant by this term; and not less so, if it be
possible to ascertain with certainty the sign by which a
tumor may be known to possess this quality. On this point,
however, I do not flatter myself that I shall be able to speak
very satisfactorily. There seems, indeed, to be a generally-
received and conventional meaning attached to the term
' malignant ' ; but it is so vague, that I have not been able

to obtain from books, or from those individuals who are the
most conversant with this subject, such a definition as would
bear the test of critical examination; and still less have I
been able to compose a satisfactory definition for myself.
The best substitute that I can offer, in the absence of the
Characte-   desired definition, is an enumeration of those characters, the
ristics of   whole or greater number of which concur in cases to which
malignant
disease.   the appellation of malignant has, by common consent, been
applied.

1. Adjacent   The first of these is the alteration which I have already
lesion.   described as taking place in the structures in the immediate
neighbourhood of the spot primarily affected.

2. Form of   The second is the peculiar figure and appearance of the
ulcer.   ulcer to which the malignant tumor ultimately gives rise.
This ulcer, as well as the mechanism of its production, I
have already particularly described.

3. Glandu-   Thirdly : As a consequence either of the external ulcera-
lar enlarge-   tion, or internal death and softening of the tumor, the ab-
ments.   sorbent glands, situated in the course of the lymphatics
leading from the part, become enlarged, by a deposit having
very much the character possessed by the original tumor.

4. Occur-   Fourthly : Besides the affection of the glands situated in
rence of si-   the course of the circulation, and, at times, without this
milar lesion
in other   having sensibly taken place, other parts of the body become
parts.   the seats of similar deposits.   Occasionally, deposits of
this kind take place simultaneously in very many structures
and parts of the body.   At other times, they are confined to
very few organs, or even to a single organ ; in which case,
the selection of the organ or organs, in which such deposit
occurs, appears to be very much influenced by the seat of the
primary affection.   Some of the instances of this kind
afford curious proofs of the inexplicable sympathy existing
between remote organs.   Thus, in a case of fungoid disease
affecting an absorbent gland in the neighbourhood of the
parotid, glands of a similar description, situated near the
upper edge of the pancreas, were found enlarged, and par-

ticipating in the disease. Scirrhous tubercles in the uterus are in the same way found in conjunction with scirrhous mamma. Of all organs, the liver is perhaps the most liable to become the seat of these secondary depositions of malignant tumors or tubercles. We find them in this situation when the primary formation has taken place in the eye, the breast, the stomach, the rectum, the mesentery, the kidney, the testicle, or, perhaps, in many other situations.

Fifthly, whilst these affections have taken place in different parts of the body, and in some instances even whilst the structural derangement continues limited to the immediate neighbourhood of the spot first affected, the system generally becomes more or less seriously deranged. The complexion loses its natural and healthy clearness, and presents a diffused sallow or leaden hue, or, in some instances, a dingy redness. The countenance is expressive of sadness or anxiety; and is so peculiar, as, in most cases, to be easily recognised by the practised eye, though it is difficult to convey a description of it in words. The patient, worn by a lingering hectic, which is generally accompanied by distressing watchfulness, usually, though not invariably, becomes extremely emaciated. To the production of this effect, loss of appetite, distressing nausea, and occasional vomiting, together with colliquative sweats, the ill-conditioned discharge, occasional hæmorrhage from the sore, and local and general pain, mainly contribute.

5. Constitutional affection.

These are the principal characteristic features of malignant disease; but it is sufficiently notorious that many of them are often absent, notwithstanding the existence of a tumor, or even of an ulcer, respecting the malignant nature of which few competent judges would hesitate to pronounce. Again : some of these characters belong to affections which are not regarded as malignant, as well as to those which are so regarded. Thus, 1. The alteration of the surrounding structures may accompany other tumors besides those which are considered as malignant ; and the peculiar nature

Inadequacy of the description now given.

The adjacent lesion is not peculiar to malignant disease ;

of the change which they undergo, when the tumor is malignant, cannot be positively ascertained by the mere application of the fingers to the tumor whilst covered by the integument: nor can it be always ascertained when the parts

are actually removed from the body.   2. The characteristic appearance of the ulcer is not at all times present; for the production of the new and external parts of the tumor, on which the elevation of the edge depends, is not constantly going forward; and, during its suspension, the surrounding more or less healthy integument will sometimes put on an appearance which affords a temporary and fallacious promise of cicatrization.   Again: ulcers possessing no degree of malignity sometimes present, in consequence of the size and arrangement of their granulations, an imper-

fect resemblance to the malignant ulcer.   3. The consecutive effect observable in the absorbent glands is far from being peculiar to malignant disease, but attends them in common with scrofulous, venereal, and common inflammations.   The nature of the changes which these glands undergo may indeed be peculiar in malignant diseases; but of these changes we can know but little, at the time when the knowledge of them would be of the greatest importance.

With respect to the 4th character which I have mentioned, or that of similar productions taking place in other organs than that primarily affected, it is one which, though it may often be suspected, can frequently not be ascertained until after death.   Moreover, the same tendency not unfrequently accompanies the production of scrofulous tubercles, which we find invading various organs in the same subject.   And again, it does sometimes happen, that cases of malignant disease, most strongly marked both with respect to the local affection and to the characteristic derangement of the general system which accompanies it, and which ultimately brings the patient to his grave, may present no trace of the peculiar structure, except in the part first affected, and in its immediate neighbourhood; even the absorbent glands

belonging to it may escape. A striking instance of this kind occurred in a patient of my friend J. Morgan. A man came into the hospital affected with fungoid disease of the testicle. The testicle was removed. The disease reappeared in the cut extremity of the cord; and a second operation was performed, which, like the first, was followed by the renewed growth of the morbid structure. No further operation could be performed. A large, bleeding, fungoid ulcer occupied the greater part of the groin, and the patient died with all the constitutional symptoms which belong to the last stages of this formidable complaint. On examining the body after death, I found that the new growth, which presented the ulcerated surface which I have mentioned, afforded a very complete specimen of the medullary or brain-like matter. I was much surprised, in pursuing the examination, not to discover any trace of the disease in the absorbent glands, or in any other part of the body. 5. Those general and constitutional symptoms which *nor are the constitutional symptoms always present;* I enumerated in the fifth place are, like the others which I have mentioned, by no means infallible. Sometimes the patient, though affected with a tumor, respecting the malignant nature of which there can be no doubt, for a long time bears up against its fatal influence : and sometimes patients, *nor, when present, diagnostic.* whose health is seriously impaired by chronic visceral derangements, present, in the complexion and expression of their countenances, appearances which induce strong suspicions of malignant disease.

Besides the indications of malignity of which I have been speaking, others, which may perhaps be regarded as of still less value, have been pointed out. Amongst these *Other symptoms of malignant disease, and estimate of their value.* may be mentioned the obstinacy with which the ulcer resists all the efforts which are made to promote its healing ; but this is a character by no means peculiar to malignant ulcers. Another character is, the enlargement of the veins in the neighbourhood of the affected part : this symptom, however, is not at all times present as an accompaniment

to malignant formation, and may be present where malignity does not exist. More stress has been laid on the peculiar darting or lancinating pain which is felt in and about the diseased part; but this feature, though strongly characteristic of some forms of malignant tumors, does not accompany all of them, and pains presenting very nearly the same character at times accompany affections of a different nature.

You will readily judge, from the sketch which I have just given, how difficult it must be, not merely to compose a concise verbal definition of the term 'malignant,' as applied to the tumors in question, but also, in many cases, to draw

the line in actual practice. For my own part, I should, in examining a tumor in the living subject, be in general disposed to suspect what has been called malignity, whenever I could detect indications of the structure which I have described, accompanied with alteration of the surrounding structures, referrible in their origin to some external violence, or to a pre-existing indolent tumor. These suspicions would be proportionably stronger, if the tumor in question occurred in a part known to be rarely, if ever, affected with that non-malignant and well-defined form of tumor commonly termed 'hydatid,' which, in common with those of a malignant character, distinctly possesses the structure alluded to. My suspicions would be progressively converted into absolute certainty, in proportion as the other symptoms previously detailed were united to those which I have assumed, as presenting themselves in the suspected

tumor. But how are we to determine, when the tumor has been removed from the body, and a question as to its malignity has been started? In the first place, I should consider some traces, however slight, of the structure which I have described, existing in some part of the morbid growth, as a *sine-qua-non* to the character of malignity. Hence arises the importance of having the whole, or a very considerable part of the tumor, submitted to our examination:

and, if possible, that part which constituted the original formation should be contained in the portion selected for examination. This point being ascertained, we may, I believe, pronounce on the malignity of the new formation with a confidence proportioned to the degree in which the new growth deviates from the natural structures of the body, but more especially from the serous membranes. The spontaneous death of an internal part of the tumor, in consequence of the strangulation of some of the pedunculated bodies which compose it, is not alone a proof of malignity; but I have little doubt that the influence which this change exerts strongly contributes to induce a malignant character. The degree of integrity or degeneration of the surrounding natural structures will also aid materially in deciding the question. When we have the opportunity of examining not only the tumor but the entire body, the presence of similar tumors in other parts of the system may warrant us in giving an unqualified affirmative, but their absence by no means proves the negative.

I must now say a few words respecting the constitutional taint, or specific diathesis, which is by many supposed to accompany the production of malignant formations. It is manifest, that the common exciting causes, to which the origin and formation of malignant tumors are wont to be ascribed, are continually operating on hundreds of individuals on whom no serious effects are produced. Hence it has been supposed, that a certain pre-existing condition of the system is an essential element to the production of the disease, although these same individuals may have enjoyed perfect health up to the time at which the exciting cause was applied. On the other hand, facts, at least equally strong, tend to favour the idea, that it is from the local affection that the constitutional taint is derived; since, in proportion to the indolence or activity of the primary affection, may in general be observed the rapidity and extent of the invasion of other parts of the system. The affection of the

On the malignant diathesis.

glands, in the course of the absorbents leading from the
diseased part, might also be adduced as an argument in
favour of the contamination of the system through the agency
of absorption: but, on the other hand, we have unequivocal
proof of this effect having taken place when the part prima-
rily affected has been completely removed before the absor-
bent glands had been affected. I shall not pursue the in-
teresting investigation of the *modus operandi* of morbid
poisons, to which these observations are calculated to lead;
but refer you to the work of my valued friends, Dr. Addi-
son and John Morgan, in which you will find the operations
of poison in general ably considered and elucidated.

Liability of
certain
structures
to malignant
disease.

There is an interesting inquiry, to which I have already
alluded incidentally, but which deserves further notice. It
is very obvious that some parts of the body are much more
liable to become the seat of these structures than others.
This suggests a query of some interest, respecting the cause
of the marked predisposition to the production of this de-
rangement in these structures. I have already observed,
that some local accidental lesion can often be referred to
as the exciting cause to which the commencement of the
developement may be referred. In the case of ovarian tu-
mors, I pointed out the circumstances which, I conceive,
expose these organs, notwithstanding their well-protected
position in the body, to frequent partial lesion of their tex-
ture; and I noticed the intermitting and periodical varia-
tions to which the functional activity of these organs is
liable, as probably contributing to favour the production of
adventitious growths, in consequence of local lesion. Let
us now inquire whether there are any peculiarities in other
parts which may tend to give them a liability similar to

Liability of
the female
mamma.

that which we find in the ovary. The female breast will,
of course, from its extraordinary liability, be the first to
suggest itself as a subject of this inquiry. Like the ovaries,
the mammary glands manifestly participate in the periodical
changes which take place in the female system: hence

the increased fulness and exquisite sensibility, sometimes amounting to actual pain, occurring in and about these organs, at or near the period of menstruation. We have, therefore, evidence of a very material variation in functional activity, independently of that more remarkable change which takes place in the glands after parturition, is attended with the production of a copious and new secretion, and often subjects them, not merely to painful, but mutilating attacks of inflammation. In conjunction with these two causes favourable to the predisposition to disease, it will be necessary to take into account the liability to the occasional exciting causes to which the mammæ, from their prominence as well as their position in the body, are unavoidably subjected. Against these dangers, the mobility of the glands, and the abundance of subcutaneous fat by which they are surrounded, afford some protection : slight violence, therefore, is often received with impunity, so long as the constitutional disposition to the production of scirrhus, and the diseases allied to it, is wanting : but no sooner is this constitutional tendency set up, by some circumstance which interferes with the general health, than the causes which I have explained are at once brought into action for its developement.

It not unfrequently happens, in persons in whom the disposition to the production of malignant disease unfortunately exists, that tumors of this kind spring up in various parts of the body, immediately beneath the integuments. These, I conceive, may be ascribed to the occasional exciting cause of very slight blows; which, with other individuals not so predisposed, would scarcely give rise to a visible bruise. The positive effect of such very slight injuries is more evident, though differently exhibited, in the case of another disease of a constitutional character ; — I mean scorbutus or purpura, when the slightest blow or pressure will often occasion a visible ecchymosis. *Occurrence of subcutaneous malignant tumors.*

Some parts appear to be predisposed to become the seat

Low degree of vitality productive of adventitious growths.

of malignant adventitious structures, in consequence of their being possessed of a lower or inferior degree of vitality. I employ this term, for want of a better, to designate a condition, which I think you will understand, when I have stated some examples of the class to which I have alluded. I employ the term ' vitality' here, as well as on a former occasion, without any connection with the mystification which sometimes attends its use. There are organs natural to the body which do not constantly maintain the same proportion of nutrition and function with reference to other parts of the body, and are consequently subjected to wasting or atrophy. The thymus gland, the supra-renal capsules, and even the mammary glands themselves, both in the male and female, are examples of this kind; which will both illustrate what I mean by a lower or reduced mode of vitality, and exemplify the predisposition to malignant disease thence arising. Nævi materni afford another example of structures whose mode of vitality is in some degree imperfect. Without inquiring into the causes which give rise to their formation, it is evident, that, though they exist as living appendages, they have no necessary function to perform; and, though often highly vascular, are possessed of a very low degree of that power which enables the different parts of our bodies to resist foreign agents, and retain their own integrity. Nævi, either on the one hand perish under, or imperfectly repair the effect of injury; or on the other, are the subject of inordinate and unrepressed developement, when an increased determination of blood takes place towards the region of the body in which they are situated. Nævi, in conjunction with the condition of vitality which I have described, possess a remarkable proneness to become the seat of malignant disease, and more especially of fungus hæmatodes. I have seen several instances in the wards of this hospital; and a very striking case occurred when I was attending the practice of Boyer, at the Hôpital de la Charité, in Paris. A man, rather advanced in years, presented a

Liability of nævus to become the seat of malignant disease.

large carcinomatous ulcer on his breast; which, he informed me, had originated in a nævus, upon which he had received a blow from the nose of a horse.

I am inclined to believe that the imperfection of the parts I have pointed out, as possessing a marked liability to the invasion of the adventitious structures under our consideration, is more dependent on their innervation than their vascularity. We may observe, that they present almost every variety in this latter respect, without there being any very marked corresponding difference in their degree of predisposition; but they appear to agree in this, that they are less than other parts under the influence of that power, the effect of which is as manifest as its nature is obscure, by which the healthy, natural structures retain their form and volume within definite limits. This power, which gives its peculiar form to our various members, and which allows of their regular and progressive developement and increase as we advance from infancy to adult age, and then suspends and arrests the process—this power or influence is sensibly impaired in those structures which, like the thymus gland and capsulæ renales, waste to a variable amount in those periods of our existence in which their functions are not exercised. The absence of the power is still more manifest in nævi, whose accidental existence does not appear to be destined for the performance of any function, and which grow, apparently, without any fixed limits as to size or figure. The adventitious structures which we see taking their origin from these parts, appear still further removed from this regulating influence; and, as to form and structure, agree only in presenting those characters which result from the cystiform structure dependent on the formation of compound serous cysts, which is probably to be referred to some general physical principles.

Liability to malignant growths connected with degree of innervation.

There is one of the animal tissues not yet enumerated, which presents a remarkable liability to malignant disease: I mean fibrous tissue, whether occurring in fascia or tendon,

Fibrous tissue very liable to malignant disease.

T

or, somewhat modified, in the form of periosteum or dura
mater.   Parts composed of this tissue, although they have
their vital functions feebly developed, are, nevertheless, suf-
ficiently uniform and fixed as to their form, extent, and
structural arrangement.   The new growths to which they
occasionally give origin are, at first, lodged in the neigh-
bouring cellular membrane; and it is a mere conjecture,
on which I lay little or no stress, that the production of
these growths may depend on some peculiarity in the mode
in which the cellular membrane and fibrous tissue are

Liability of
simple tu-
mors to be-
come ma-
lignant. connected.   The liability of parts of which I am next to
speak is of much more practical interest and importance.
I allude to tumors not originally possessing, or supposed to
possess, a malignant character, but ultimately acquiring it.
Where the tumor in question already possesses the charac-
ter of compound serous cysts, as in the form of ovarian
dropsy, with the description of which I commenced, and in
those affections of the breast and testicles which are de-
scribed as hydatid, the change from non-malignity to ma-
lignity is neither great nor obscure.   Even in these cases,
it would appear that the change does not take place in the
parts once formed; but the new parts, which are successively
added to the tumor, progressively deviate from their re-
semblance to the serous membranes.   I cannot adduce any
better example of this, than the cases of ovarian tumor;
in which the patient, having long laboured under incysted
dropsy, ultimately sinks, and fungoid growths are found
forming a part of the diseased mass.   The same kind of pro-
gressive change may be seen in solid tumors in different
parts of the body.   This may be observed where a succession
of tumors has been removed from the same parts, and where
parts of the same tumor have been removed at different pe-
riods.   The portions first removed may present a very
doubtful aspect, whilst those taken at a later period leave
no room for hesitation.   With respect to tumors which,
at their commencement, possess nothing of the structural

characters which we have been considering, the mode in
which they acquire malignity is somewhat different. Ne-
vertheless, they agree in this, that the change is not
effected by the transformation of the parts of the tumor
originally formed; but they may be associated with those
parts which are possessed of an impaired or low degree
of vitality, such as wasted organs and nævi, and are
consequently liable, from any external injury, or cause
of increased disturbance inherent in the system, to give
rise to the adventitious structures in question. Although
some local lesion may almost invariably be referred to
as the exciting cause for the formation of the first tumor,
and although similar lesions may determine the production
of others when the system has been brought under the
influence of malignant disease, yet the existence of such
exciting cause is by no means necessary in this latter case.
These secondary tumors are often produced in a manner of
which we can give no other explanation, than an unsatisfac-
tory reference to that mysterious sympathy which connects
particular organs, both pathologically and physiologically.

There is another mode of extension of the disease, in
which neither the sympathies in question nor direct vas-
cular communication are concerned. I refer to the con-
tamination of parts which are merely in contact, oppo-
sition, or approximation to each other. As instances
of the contamination of juxtaposed parts, I may mention
those cases in which an ovary, the mesentery, or the liver,
being the seat of a malignant tumor, the parts in contact
with it, whether convolutions of intestine or abdominal
parietes, become similarly affected. In such cases, it might
be questioned, whether some principle, capable of de-
ranging the nutrition of the part which becomes secon-
darily affected, does not pass by transudation. The con-
current inflammation of contiguous portions of a serous
membrane affords an analogy favourable to this idea.

Adventitious productions of a malignant character are

Influence of
proximity.

T 2

sometimes formed along the course of the blood-vessels, in
so marked a manner, as to render it more than probable
that they are in some way connected with the extension of
the affection. I have already noticed two rows of fungoid
tumors following the course of the intercostal vessels, in the
case of Martha Doherty (see p. 173). I have also repeat-
edly seen tubercles of the same character arranged in the
course of the arteries of the mesentery, omentum, and
other parts within the abdomen.

LECTURE X.

ON MALIGNANT DISEASE.

SCIRRHOUS AND FUNGOID TUMORS.

DISTINCTION BETWEEN CLASSES OF MALIGNANT GROWTHS.—ON THE CHA-
RACTERS, STRUCTURE, AND SIZE OF SCIRRHOUS TUMORS.—LESION OF PARTS
ADJACENT TO SCIRRHOUS TUMORS—ULCERATION OF SCIRRHOUS TUMORS—
SCIRRHUS DOES NOT DEGENERATE INTO FUNGOID DISEASE.—SPONTANEOUS
AND ARTIFICIAL CURES OF SCIRRHUS—ON THE UTERINE TUMORS TERMED
SCIRRHOUS—NOMENCLATURE OF FUNGOID DISEASE—POINTS OF CONTRAST
BETWEEN SCIRRHOUS AND FUNGOID DISEASE—VASCULARITY OF FUNGOID
DISEASE—SOLID PORTIONS OF THIS FORMATION—EVIDENCES OF CYSTIFORM
STRUCTURE IN FUNGOID TUMORS.—PHÆNOMENA OF OSTEOSARCOMA—AFFEC-
TION OF SURROUNDING STRUCTURES IN FUNGOID DISEASE—ON GELATI-
NOUS OR GUM CANCER—ASSIMILATION OF SCIRRHUS TO FUNGOID DISEASE
—DIAGNOSTIC MARKS COMMONLY RELIED UPON.

GENTLEMEN,

Having, in my last Lecture, completed the general remarks
which I thought it necessary to offer respecting the mode
of formation, anatomical structure, composition, and habits
common to the greater number of the heterologue, adven-
titious deposits that are met with in the human body, I now
proceed to speak of the different species of these structures,
but especially of those to which the term 'malignant' has
been applied. Formerly, as I have already stated, in a re-
mark borrowed from Laennec, all the forms and varieties of
these productions were vaguely comprehended under the
term 'cancer,' or 'carcinoma.' Although, as I have endea-
voured to shew, these formations, by their structure, mode
of developement, and, for the most part, by their influence
on the system, are with propriety to be referred to one
common type, and grouped into one family, yet, as we shall
presently see, there are certain peculiarities, which will Distinct
justify us in forming at least three specific divisions. Their classes of
limits, it is true, are so ill defined, and they pass so gradually malignant growths.

into each other, that it is often difficult to decide to which
of the species a particular specimen should be referred.
In the best-marked cases, however, there is no difficulty
of this kind.

The distinctions of which I am speaking were, I believe,
first pointed out and insisted on by Laennec and Bayle, in
France. It happened very nearly at the same time, and
without any intercourse between the two countries, that
Burns, Hey, and Abernethy, were engaged in the investiga-
tion of the same subject in this country. Their labours
have been followed up, amongst our countrymen, by War-
drop, Langstaff, Cullen, and Carswell; and, in France, by
Cayol, Breschet, Cruveilhier, and Ferrus.

I commence by speaking of that form of tumor to which
the name of 'scirrhus,' or 'true scirrhus,' has been more
particularly applied. As the term implies, tumors of this
denomination are characterized by their hardness, which, in
many instances, is at least equal to that of cartilage; but
they want the uniform texture of this natural tissue, and, in
this respect, bear a nearer resemblance to fibro-cartilages.
Hence, when divided by incision, they give rise to some
noise, and are said "to cry under the scalpel." It is not
only in density of structure, but also in colour, that the
scirrhous tumor exhibits a want of uniformity. These va-
riations may be satisfactorily referred to the mode of forma-
tion which I have pointed out. The hardness of these
tumors appears to be intimately connected with the slow-
ness of their growth; and the comparative indistinctness of
the structure, to which I have alluded, is another effect pro-
ceeding from the same cause.

True scirrhous tumors appear sometimes to depend on a
single primary tumor: at other times, several may be satis-
factorily made out. That part of the tumor which appears
to have been the common origin of the primary cysts, where
there are more than one, or from which the contained
pedunculated bodies radiate, when there is only a single

primary tumor, is, in general, the most indurated portion, and is, at the same time, the most indistinct in its structure. When examined externally, after the surrounding natural structures have been carefully dissected off, this part of the tumor is found to be the most irregular, has a somewhat corrugated appearance, and suggests the idea of its having been a sort of root by which the adventitious growth was implanted on the natural structures. The radiated appearance so strongly insisted on by most authors who have described scirrhous tumors, and with the rationale of which I have made you acquainted, is particularly conspicuous when the section passes through this point. The fluid part of a true scirrhous tumor bears, in general, a very small proportion to the rest of the structure : it has a viscid or mucous character where softening has not taken place ; but, where this process is going on, it assumes the character of an offensive, ichorous discharge, and acrid and highly deleterious qualities have, by some, been ascribed to it. The process of softening sometimes commences internally at one point ; at other times, in several small isolated points ; in others again, the ulceration through the integuments is the first part of the process of decay.

True scirrhous tumors, notwithstanding the length of time during which they continue to grow, very rarely acquire a considerable size ; and, indeed, it not unfrequently happens that the wasting of the neighbouring structures, and more especially of the female mamma, which is by far the most frequent seat of true scirrhus, more than compensates for any increase of volume dependent on the new formation. Sir Charles Bell has particularly pointed out this source of fallacy, which has induced some persons to assert that scirrhus was not always productive of tumor. *Size of scirrhous tumors.*

True scirrhus appears to be a form of malignant disease essentially peculiar to the more-advanced periods of life. It would seem, indeed, that the more resisting nature of the different tissues, and the more tardy and feeble operation *Scirrhus is a disease of advanced life.*

of the function of nutrition which characterize the decline
of life, are the principle causes which render scirrhus a ma-
lignant disease of old age.

The chronic characters which belong to scirrhus are not
confined to the essential part of the tumor itself: the sur-
rounding structures participate in it. By repeated attacks
of inflammation arising from the presence of the tumor, the
neighbouring cellular structure becomes thickened and in-
durated. It is on the implication of the nervous fibrillæ of
the part in this altered structure that, as I apprehend,
principally depends the peculiar and characteristic lancina-
ting pain which accompanies the accessions of inflammation
to which an organ affected with scirrhus is continually
liable. This indurated cellular membrane has often been
observed extending from the external part of the tumor,
amongst the adipose structure in which the mammary gland
is situated. Like inflamed and thickened cellular membrane
resulting from other causes, this structure becomes gradu-
ally contracted, and most materially contributes to the
puckering and distortion of the affected part. In the mam-
mary gland, in which this puckering has been chiefly noticed,
the traction exercised by the lactiferous tubes is the cause
generally assigned. I do not deny that they may have
some share in producing this effect, both by their own
obliteration and contraction, and also as the medium by
which the gland, altered and displaced by the tumor, acts
upon the nipple; but I feel pretty confident that the cause
which I first assigned is the principal one. These same
prolongations of indurated cellular membrane, proceeding
from the tumor into the surrounding adipose substance,
appear to have been considered as prolongations of the
radiating lines observable within the essential part of the
tumor, and to have been regarded as a part of the scirrhous
structure itself; in fact, as fibres of the disease on which its
re-appearance after an operation mainly depends. For my
own part, I very much doubt whether this altered cellular

membrane itself really possesses any thing of the malignant
nature; although I can easily conceive that the new tumor,
by which the disease makes its re-appearance, may have
taken its origin in the course of one of these indurated
prolongations left in the surrounding structures.   I believe
this circumstance is to be explained in the following
manner.   In dissecting away the fat from the principal
part of a scirrhous tumor, I have had occasion to notice
these prolongations of cellular membrane; and, in doing so,
I have observed very small and delicate pedunculated cysts,
some of which scarcely exceeded the size of a pin's head,
dispersed upon these prolongations.   It is to the develope-
ment of one or more such cysts, rather than to the altered
cellular membrane itself, that the new tumor is to be attri-
buted.

True scirrhous tumors, in many instances, remain for a
length of time in an indolent state, without passing into a
state of softening, or producing an external ulceration.
Before this ulceration takes place, the tumor becomes ad-
herent to the skin; and though there is generally but little
redness observable in these tumors, a spot, most frequently
of small extent, becomes of a bright and cherry red, or of
a purple livid colour, before the continuity of the integu-
ment is destroyed.   It is needless that I should again de-
scribe the characters of a malignant ulcer which are, in
general, very completely seen in the ulcerative stage of true
scirrhus.   It may however be said, that the ulceration of
true scirrhus is accompanied by a more decided loss of sub-
stance than that of the next form of tumor of which I shall
have to speak, viz. cerebriform cancer, which is often at-
tended with large, rapid, and irregular growths from the
ulcerated surface; whence the names of fungoid disease,
fungus medullaris, &c., have, in all probability, been de-
rived.   The ulceration of true scirrhus is, indeed, bounded
by its elevated wall of circumvallation; but the central parts,
gradually hollowed away by the softening of the very imper-

Marginal note: Ulceration of scirrhous tumors.

fectly organized structure, presents a foul and deep chasm.
It is to this state of the ulcerative stage of true scirrhus
that the appellation of cancer, or carcinoma, in the most
restricted sense, has been applied.

A scirrhous
tumor does
not gene-
rate into a
fungoid.

Some pathologists have considered, that both cancer and
fungus result from the degeneration of scirrhus; that, if
acute inflammation attack the scirrhous structure, ulceration
follows, presenting all the characters of cancer; but that,
if the structure undergoes a gradual degeneration, and
breaks down, a cerebriform mass is the result. I must
avow my dissent from this doctrine, although promulgated
by the learned authors of the Dictionnaire de Medicine, in
an article which I believe to have come from the pen of
Breschet. I see no reason to doubt that these two species
of diseased structure depend on differences which exist *ab
initio*; and I cannot help being more particularly surprised
that cancer should have been considered as a more acute
form than the fungoid disease.

Hæmor-
rhage takes
place from a
carcinoma-
tous ulcer.

In a cancerous or carcinomatous ulcer, it not unfrequently
happens, that one or more vessels give way, and lead to a
hæmorrhage, which, in some instances, is very profuse.
Such hæmorrhages are, however, very different from those
which form so characteristic a feature of fungus hæmatodes.
In cancer, the greater part of the ulcerated surface, though
irregular, is possessed of considerable, nay, almost cartila-
ginous firmness: the hæmorrhage in question takes place
from particular points; and, if we attempt to inject such an
ulcer with fine injection, either after its removal from the
body or after the death of the subject, we obtain but very
imperfect success, because the larger portion of the injec-
tion escapes from the open arteries. Such hæmorrhages
are so far from being attended with an exuberant, sprouting,
fungous growth, that, at times, they seem to be the princi-
pal means of procuring a temporary improvement in the
appearance of the ulcer.

I believe that it has sometimes, though indeed very

rarely, happened, that tumors possessing the characters of true scirrhus, and regarded as such, have become detached by the sloughing of the surrounding structure; and, being in this way completely thrown off from the system, the cavity which they occupied has been filled up by granulation, the surface has cicatrized, and a permanent cure has been obtained. The occasionally successful practice of some empirics consists, I believe, in attempting to induce this process artificially. Arsenic appears to be the principal agent to which they have recourse for this purpose. I am far from wishing to advocate this mode of treatment; which, whilst it offers very little advantage that cannot be more readily obtained by extirpation with the knife, is liable to serious objections to which the use of the scalpel is not exposed. It can only be in the early periods of the affection, when the surrounding structures do not participate in the disease, and when the constitution is yet untainted, that there is any chance of success, from this or any other means. I may state, however, that some years since a tumor formed in the breast of a lady of my acquaintance, who was about the age the most liable to cancer. From the account given to me respecting the character of this tumor, it bore the strongest resemblance to true scirrhus. Being unwilling to submit to the knife, this lady placed herself under the care of a female quack, who professed to cure cancers in the way which I have described. Under the use of the secret means which this person employed, the tumor, which consisted of two primary portions, was completely detached entire. The wound was closed, leaving a very trifling cicatrix; and the lady has had no return of the affection. During a part of the time that I spent in Rome, I lodged with a Dr. Viale, who was surgeon to the Inquisition. He was an elderly man, of considerable experience. He assured me that he had long been in the habit of adopting a plan of treatment such as I have described, both in malignant and other tumors, with very considerable success.

Spontaneous cure of scirrhus— a thing possible, not probable.

Methods of extirpating scirrhous tumors.

I have already, perhaps, too far wandered from the province of the morbid anatomist, into that of the surgeon; and shall not attempt to enter into the detail of the symptoms which attend the progress of scirrhus and cancer.

Organs in-
vaded by
scirrhus.

Although the mamma, the uterus, and the lips are the parts the most frequently attacked, few if any organs can be said to be wholly exempt from scirrhus. It is not, however, so prone to invade numerous organs in the same individual as the fungoid disease of which I shall have next to speak.

Uterine
tumors
termed
scirrhous.

Before quitting, for the present, the subject of scirrhus and cancer, there is one form of tumor, to which the term of scirrhus is applied, which differs so considerably from some of those which I have been describing, that I must not pass it over unnoticed. I allude to the scirrhous tubercles developed in the body of the uterus. They possess a well-defined, rounded figure, and a close, compact tissue, in which the structure, referrible to the same type as the cysts to which I have so often alluded, is tolerably distinct, on a much larger scale than that generally observable in true scirrhous tumors in other parts of the body. They rarely, if ever, present any cells or cavities. They acquire a much larger size than true scirrhous tumors in other parts of the system. They never, or at most very seldom, pass into the stage of softening or ulceration; and, when formed in the uterus without any other organ having exhibited a tendency to the production of scirrhus, the formation almost always continues to be wholly confined to this organ; consequently they do not appear to be accompanied by any constitutional taint. On the other hand, their occasional formation in conjunction with the primary scirrhous and cancerous affection of the mamma and other parts necessarily connects them with the malignant disease of which I have been speaking. Although these tumors or tubercles are little liable to the process of softening, their formation disposes them, in common with other growths of the same family, to a dimi-

mution, or loss of their vitality. It would seem, however, that this takes place very gradually, and is accompanied by deposition of bony or earthy matter: so that, by the time the nutrient vessels are nearly or quite obliterated, the scirrhous is converted into a bony structure, little suscepti- ble of change, and which may consequently be retained to an almost indefinite period in the system, without material injury to the organ in whose substance it is imbedded.

The peculiarities which I have just described as belong- ing to the scirrhous tubercles of the uterus, are, doubtless, in a great measure referrible to the part in which they are developed. In the first place, the uterus, as I have before remarked, is naturally disposed to accommodate itself to a stimulus which excites to an increased supply of nourish- ment. It is no less remarkably calculated to yield pas- sively to the distension of bodies progressively increasing within it; and, moreover, its structure is but little suscepti- ble of morbid actions. Hence the new or adventitious growths have an abundant supply of the nutrient fluid. Their enlargement meets with no violent or partial obstruc- tion; but, at the same time, is subjected to a steady, mode- rate, and uniform pressure, which in all cases tends mate- rially to diminish the relative proportion of the fluid parts, and to which, in the instance before us, we may attribute the absence of cells, and the firm and compact structure of the tumors. Since the fibres of the uterus rarely contract, except during parturition, we need not be surprised to find that the scirrhous tumors developed amongst them are very far from being modified similarly to those which I have mentioned as being formed amongst the ordinary muscular fibres; as, for instance, in the deltoid or masseter. To the little susceptibility which the uterus exhibits with respect to morbid actions, we may most probably attribute both its own immunity from the scirrhous affection, and the absence of constitutional taint.

The affection of which I have next to speak, not-

Causes of peculiarities of these tumors.

withstanding that it must have been long familiar to the
eyes of practised pathologists, has only recently been re-
garded and described as a particular disease. It has, how-
ever, already received several names; which, by some, are
used almost indifferently, or as synonymous; whilst by
others they are considered as denoting different varieties,
if not species, of malignant disease. Thus we find the
terms 'encephaloid tumors,' 'cerebriform cancer,' 'medul-
lary sarcoma,' 'spungoid inflammation,' 'fungus hæma-
todes,' and 'fungoid disease.' I am rather inclined to prefer
the last of these terms, namely, fungoid disease, not merely
in imitation of my distinguished teacher, Sir Astley Cooper,
but because, whilst it indicates that exuberant growth
which almost invariably characterizes this class of tumors, it
leaves undefined the particular character of the structures
composing them, and consequently does not exclude any of
the varieties comprehended in the division of which I am
now to speak.

One of the most striking features which distinguish the
fungoid disease from true scirrhus is to be found in the
extent and rapidity of the developement of fungoid tumors.

Points of
contrast be-
tween
scirrhus and
fungoid
disease.

Whilst, as we have seen, true scirrhus often remains for a
considerable length of time in a chronic and indolent state,
and, after a growth of some years, produces a tumor of only
a moderate size, the fungoid tumor in the space of a few
weeks is sometimes seen to attain to a prodigious size, and
to pass through all the stages which belong to it in common
with the other members of the same family of adventitious
structures. Whilst true scirrhus is almost exclusively the
disease of advanced life, the fungoid disease makes its
appearance in individuals of every age, but its most formi-
dable and extensive ravages are seen in the young. Whilst
in true scirrhus the fluid matter forms a very inconsi-
derable and scarcely notable part of the structure, in the
fungoid tumor it is frequently abundant, presents a great
variety in its characters, and is often collected in cavities of

considerable size.   In the scirrhous tumor, the peculiar
mode of formation which I have pointed out must often be
traced by analogy, guided by faint and partial indications;
but in the fungoid disease we meet with those unequivocal
manifestations which almost speak for themselves. In true
scirrhus, the traces of vascularity are very faint; but in the
fungoid disease, the adventitious membranes possess a high
and preternatural degree of vascularity, and the vessels,
which we see ramifying in them, are not only numerous, Vascularity
but large. By some, they have been considered to be prin- of fungoid
cipally arterial; by others, venous.   I will not attempt to
decide to which class of vessels they are most nearly allied,
but they appear to consist of the capillary vessels of Bichat
on a large scale; and, as we sometimes meet with these
membranes of a bright and arterial red, and at other times
of a venous or livid hue, it seems probable that accidental
or fortuitous circumstances have the principal share in de-
termining to which class of vessels these capillaries should
most incline.   These newly-formed vessels, though large
and numerous, are extremely weak and tender, and derive
little or no support from the structure through which they
ramify or by which they are surrounded : they are there-
fore liable to give way at numerous points ; and hence pro-
ceed those frequent and extensive hæmorrhages which so
often characterize these tumors, and have led to the term of
fungus hæmatodes, a name not inaptly applied to many of
them.   Sometimes the hæmorrhage from these vessels pro- Extrava-
duces an effusion into the cavity of the membrane reflected sations of
over an inferior order of pedunculated cysts or bodies; and fungoid
distends it into a bag filled with blood, the characters of tumors.
which will vary according to the time which has elapsed be-
tween its effusion and the making of the examination.   At
other times, the effused blood infiltrates the more solid
parts of the tumor, and produces an appearance which, by
Laennec, has been well compared to an apoplectic clot.

  The more solid parts of the tumor differ, in a marked

manner, from those which compose the scirrhous tumor. In
this disease, the secondary cysts, which are often of large
size, generally become filled with a material which at first
bears a considerable resemblance to tender or feebly co-
agulated fibrine or plastic lymph. New vessels speedily
shoot into this substance; which, being neither susceptible
of perfect organization, nor calculated to remain inert and
dormant, rapidly but gradually loses its vitality, and,
like other transparent parts in which such a change is
effected, becomes by degrees opaque, and bears, in consis-
tence and appearance, a close resemblance to the substance
of the brain of a child. Hence the terms ' cerebriform
cancer,' ' encephaloid tumor,' and ' medullary sarcoma.'
The idea of this resemblance has been carried so far by
Professor Maunoir of Geneva, that he has even considered
that an adventitious production and deposit of cerebral
matter actually takes place in this disease, and constitutes
the bulk of the tumor: such an idea I consider perfectly
inadmissible. I am not aware that even a single nervous
fibrile has ever been discovered in the essential part of the
fungoid growth. Although in fungoid disease the solid
part of the tumor often bears a striking resemblance to
cerebral substance, we frequently find it, on the one hand,
deviating into a much more firm material, and, on the other,
into one of a softer and grumous consistence. Sometimes
it has a minutely foliated structure, of a pearly white co-
lour. When the diseased structure has completely lost
its vitality, it breaks down into a variously-discoloured, pul-
taceous, grumous mass, in which the remains of the mem-
branes of the secondary cysts and their vessels may often
be detected.

Evidences
of a cysti-
form struc-
ture in
fungoid
tumors.
Although in a recently-formed tumor, or in the newer
parts of an older one, the traces of that mode of formation,
on which I have insisted, are sufficiently evident, they are
very much lost or obscured as the process of decay ad-
vances. It is also, at times, difficult to distinguish it when

the tumor has only advanced to the stage of opacity ; pro-
vided that the substance of the tumor be very uniform, and
the membranous parts not only thin and tender, but ad-
herent amongst themselves and to the contained substance.

The characters of fungoid disease are very much modi-
fied by the tissues in which the tumors are developed.
Though I shall not attempt to particularize all these va- Peculiarities
riations, I must not wholly pass over the peculiarities which disease
of fungoid
this disease exhibits when it affects the bones.   When the affecting
bone.
fungoid disease takes its origin in a part of the osseous
system, bony matter continued from the natural structure
forms a striking part of the new growth, through which it
often radiates from that part of the bone in or near which
the disease commenced. The bone thus formed is of a loose
and feeble texture, compared to that of healthy bone.   It
would appear that the deposit of bony matter only takes
place in that part of the tumor which is subjected to the
pressure of the periosteum, which is often greatly distended
by the new growth : its fibres become separated by this
distension ; the morbid growth then advances through the
opening, proceeds with increased rapidity, and soon loses
all trace of bony deposit.   It is not common for fungoid
tumors to shew any disposition to ossification, except when
originating from bone in the manner which I have just
described : nevertheless, in some rare instances it is met
with, but it presents very different characters from those
which are at times observed to accompany true scirrhus.
It is not, as in these last cases, the central and most com-
pressed part of the tumor which forms the bed in which the
earthy matter is deposited ; but the cysts themselves become
converted into bony shells, circumscribing their broken-
down contents.   I have only noticed this phænomenon in
some comparatively chronic cases of this disease.   I appre-
hend it is very rare, in this affection, for the morbid
growth to remain stationary for a sufficient length of time
to admit of the process of ossification being carried on.

U

Infiltration
of surround-
ing struc-
tures.

Fungoid disease is still more prone than true scirrhus to affect the surrounding structures in the mode which is commonly called infiltration.   I do not here undertake to offer an opinion respecting the propriety of this term; which I merely employ, in compliance with habitual usage, to denote a particular state that, I apprehend, will be readily understood.

Affection of
the absor-
bent glands.

This disease, like true scirrhus, also extends to the lymphatic glands, through which the absorbent vessels pass, in their way to the thoracic duct or right trunk.   This, however, is not the only mode in which the disease extends from the part first affected.   The veins leading from it are said to have been found filled with the cerebriform matter which characterizes this disease, and the fact has been adduced as an argument in favour of venous absorption; whilst, on the other hand, the advocates for lymphatic absorption have, with equal plausibility, brought forward the presence of cerebriform matter, not only in the absorbent glands, but also in the absorbent vessels themselves.   The presence of cerebriform matter in either of these sets of vessels is no proof that it has been absorbed by them : on the contrary, it seems far more likely that it had been actually secreted by their own internal surfaces, since the very consistence of this matter seems to shew that it could not have been transmitted through these vessels, like the blood or lymph which they are destined to convey.   Though this mode of the extension of a local disease is never exhibited, so far as I am aware, by true scirrhus, it is by no means peculiar to fungoid disease in its suppurating or softening stage : similar phænomena are sometimes observable in both common and scrofulous inflammation.

Gum cancer.

A disease dependent on adventitious structure, and described by Laennec under the title of 'gummy cancer,' or the 'cancer gelatineuse' of some pathologists, appears to bear the closest relation to fungoid disease, if it be not identical with it.   The few cases of this variety that have fallen

under my notice were all situated in the abdomen, either attached to, or situated at no great distance from the alimentary canal, and most commonly in the neighbourhood of the stomach and rectum. It is not very uncommon in connection with tendon or bone, and it may occur in a variety of other structures. It does not appear nearly so prone to contaminate the system as some other forms of malignant disease; yet it does at times invade different organs in the same subject. Most of the specimens of this structure which I have had an opportunity of examining closely, resembled, in their anatomical characters, those ovarian cysts which I described as having broad and extended bases. In fact, there was no appreciable difference either in the structure and arrangement of the cysts or in the composition of their contents. The diseased structure in this variety, whilst fully as soft as the brain-like matter already described, presents a certain degree of translucence or even transparency, with far more tenacity than is ever possessed by the cerebriform matter in its softened state. In consistence, it bears considerable resemblance to extremely thick mucilage or arrow-root, but is somewhat thicker than these substances. This form of cancer affords another illustration of the principle which I explained in a former Lecture; when I remarked, that the products of the disturbed nutrition of a particular part are liable to be modified by the structure of the surrounding natural parts: for it seems probable, that the regular production of mucus on the internal surface of the alimentary canal may have been one means of giving the character to the morbid structure formed beneath the mucous membrane within the parietes of the alimentary canal; such being, as I have already said, one of the most frequent seats of this affection. In one of the best cases which I can call to remembrance, the stomach, not far from its pyloric extremity, was the principal seat of the disease.

I have already noticed, that, notwithstanding the palpably

distinct characters of the best-marked cases of scirrhus and
fungus, the two affections make such reciprocal advances to
each other, that, in many instances, it is almost impossible
to decide to which of them a particular growth is to be
ascribed. Thus, we sometimes find tumors which have all
the hardness of scirrhus, with a structure on the large and
distinct scale, which is more characteristic of fungus. This
intermediate form appears to be an essential and per-
manent feature of the tumor, rather than to depend on a
particular stage of its formation.

Combina-
tions of
scirrhus and
fungus.

We not only meet with the various intermediate gra-
dations between well-marked, true scirrhus and the fungoid
disease, but we also find the various combinations of
these in the same subject : and it must be admitted, that
these facts form the strongest arguments in favour of
those who consider that the two diseases are one and the
same, and admit of no division. The most common compli-
cation of this kind consists in the presence of true scirrhus
in one organ—as, for instance, in the mamma—in conjunction
with fungoid tumors in others ; such as, the liver, spleen, and
kidneys. It sometimes, though less frequently, happens, that
one part of a tumor has the character of true scirrhus,
whilst another part is decidedly fungoid. This complica-
tion is generally produced, when, in the progress of the
tumor, one part escapes from the containing cyst, and grows
under less pressure and with increased supply of nourish-
ment.

Defence of
the distinc-
tion made
between
scirrhus and
fungus.

You will, perhaps, be disposed to query the neces-
sity of making a distinction between affections which pass
insensibly into each other, and may be united in one
individual. The best answer that I can give is, that, not-
withstanding these almost imperceptible gradations, nature
herself, towards either extreme, presents such well-marked
differences, not only in the tumors themselves, but in their
effects, as to render the employment of distinct terms at
least convenient. Moreover, not only because authors

who have treated of these affections, but also because me-
dical men, in speaking of them, are continually employing
the different names to which I have alluded—although, it
must be confessed, in many instances, with a great degree of
vagueness, more or less excusable from the very nature of
the subject—it appeared necessary that I also should employ
them, and, by dwelling on the peculiarities belonging to
the different forms when well-marked, not only render the
distinction more easy, but also, in defect of positive dis-
tinctive characters (such as we may find, for example, in the
artificial classification of plants), give that general idea of a
natural order which may enable us, in most instances, to
refer particular specimens with sufficient accuracy to one or
other form. Where the distinction is the most difficult, it
is obviously of the least importance.

The most common distinction which appears to arise in
the minds of pathologists, when speaking of cancer and fun-
goid disease, is derived from the hardness of the one, and
the comparative softness of the other. Consequently, the
first experiment made upon a specimen, after its removal
from the body, is to apply the fingers to it with sufficient
force to partially crush and injure the specimen. If it be
soft, it is generally considered to be fungoid. If it re-
sist with impunity, it is, perhaps, without further inquiry,
set down as true scirrhus, which appears to be the same
thing with what the vulgar call stone-cancer. Patients
labouring under cancer are not unfrequently curious to be
informed whether the disease under which they are labour-
ing is stone-cancer, or of a different kind : hence, it is not
wonderful that the profession should seek to be familiar
with this manual test, which may facilitate their answering
the question. There is generally some foundation for
current popular opinion ; and that which gives rise to the
question to which I have alluded, might be adduced as an
argument, not only in favour of the reality of the difference,
but also of the importance of making it. Hardness alone

Methods of distinguishing cancer from fungoid disease.

Degree of hardness.

is, however, by no means an adequate test; although it is, perhaps, the best on which we could singly rely. A fungoid tumor may be hard, when, as is sometimes the case, its enclosing cysts are ossified; but this kind of resistance is very distinct from that of a scirrhous tumor, which, without possessing the hardness of bone, has a firm structure throughout. The peculiarity of the bony character of the rare cases alluded to, will, moreover, generally lead to a further examination, when the cause of doubt, if any existed, would be removed. Tumors enclosed in very dense capsules, without being bony, will sometimes possess a degree of firmness which would render the mere employment of pressure between the thumb and fingers inconclusive. The cases in which fallacy is most likely to occur, are, First, in those instances in which a tumor, depending on a heterologue deposit, and, from its size, form, pretty rapid growth, freedom from acute pain, and other characters, having strong claims to be regarded as fungoid, nevertheless possesses, if not throughout, at least in part, the compact, dense, and consistent character of true scirrhus. Here the verbal distinction is really of no importance, more especially if some of these peculiarities are mentioned at the same time. The second case of probable confusion occurs in some instances, in which a very considerable induration takes place independently of any heterologue formation, and merely resulting from the thickening and condensation of the cellular membrane or some other natural structure, in consequence of common inflammation, or any similar cause, having occasioned a deposit of lymph, which has become contracted and feebly organized. This cause of fallacy has been of sufficient force to induce a distinguished French pathologist to consider such induration as absolutely identical with scirrhus. From this opinion, which induces a confusion very different from that which I last mentioned, I most widely dissent: and I feel persuaded, that however closely indurations of this kind may, in their degree of firm-

Cases in which hardness is fallacious.

ness and resistance, resemble true scirrhus, a careful atten-
tion to the indications of internal arrangement and external
form, dependent on the mode of formation, will invariably
be found to clear up the difficulty, and lead to a distinction
which is of no small practical importance. The character
deduced from hardness of texture, on which, as I have said,
so much stress is laid, is not only judged of by the applica-
tion of the finger, but by its resistance to the knife : and if
it be found to possess the firmness of cartilage or fibro-
cartilage, and, in consequence, to produce some degree of
noise, or what is called 'cry under the scalpel,' it is set down
as scirrhus. These are, however, not infallible indications ;
since they are met with in scirrhus, in common with the
indurations before alluded to. If, on the other hand, the
structure be cut through with little resistance, and is *Characters of fungus.*
either throughout of a soft texture resembling brain, or
have the character of coagulable lymph with partial and
imperfect opacity ; or if the tumor contain cells enclosing
blood either solid or fluid, or collections of fluid or grumous
character with any degree of sanguinolence ; the case is re-
garded as fungoid, and receives, according to its particular
character, some one of the names which I have enumerated,
as applied to those tumors which I believe I am correct in
stating to be generally included under the term fungoid; viz.
encephaloid tumors, cerebriform cancer, medullary sarcoma,
spungoid inflammation, fungus medullaris, and fungus hæ-
matodes. These different appearances, when distinctly
marked, will, I believe, be found sufficient to warrant the
employment of one or other of these terms : yet it must
be confessed, that we do occasionally meet with specimens
respecting which the ablest judges are divided. Here,
I apprehend, the distinction is of no importance.

A far greater degree of vascularity in the membranous *Vascularity, growth, and size of fungus dissimilar from those of scirrhus.*
cysts enclosing fungoid matter, and even in some cases the
presence of very distinct though feeble vessels in that ma-
terial itself, may be regarded as a characteristic difference

between fungus and scirrhus: yet here, as with every other
distinction which could be adduced, the transition is gradual.
A most remarkable dissimilarity between true scirrhus and
the best-marked cases of fungoid disease is to be found in
the rapid growth and prodigious size of the latter. In fact,
to this cause may be referred some of the largest tumors of
which the records remain in the annals of surgery; as, for
example, some remarkable cases described by the late dis-
tinguished Hey of Leeds. Amongst the plates in John Bell's
Surgery, there are representations of enormous tumors
which appear to have been of this kind. In our collection,
you may see sufficient proof of the magnitude to which fun-
goid tumors may attain. A large size may then, in some
cases, be appealed to as a distinction between scirrhus and
fungus. Yet we must not be misled by the converse.
A very small tumor may have quite the fungoid character.
Yet even in the smaller fungoid tumors, we may fre-
quently notice that their structure is on a larger scale than
in true scirrhus. On this depends another feature of fun-
goid tumors, which I must not omit to mention. They
frequently have a nodulous or lobulated figure, resulting
from the irregular protrusion of the secondary tumors.
When, as is sometimes the case, these secondary tumors are
formed by cysts containing more of fluid than solid matter,
we may detect decided fluctuation; but it more frequently
happens that the consistence of the contained material is
such as to allow of a degree of yielding, not amounting to
fluctuation, but which, together with the lobulated form,
gives to the fungoid so much of the character of a steato-
matous tumour, that the *tactus eruditus*, to which sur-
geons lay a peculiar claim, will not always enable them to
make the distinction.

LECTURE XI.

ON THE

COLOURS OF THE HUMAN TISSUES.

INTRODUCTION OF THE SUBJECT OF COLOUR—THE COLOUR OF TISSUES IS DERIVED FROM THE BLOOD—COLOURS OF MOST COMMON OCCURRENCE—ON RED COLOUR—CAUSES OF THE REDNESS OF THE BLOOD—PURPLE COLOUR AS SEEN IN INSPECTIONS—BLACK COLOUR OF THE BLOOD—PRODUCTION OF BLACK COLOUR BY SUBSIDED INFLAMMATION, SULPHURETTED HYDROGEN, &c. —BLACK PULMONARY MATTER—BLACKNESS OF BRONCHIAL OLANDS—BLACK COLOUR OF CERTAIN SOLID TISSUES—CAUSES WHICH FAVOUR THE PRODUCTION OF BLACK MATTER.—ON YELLOW, AS AN ANIMAL COLOUR—YELLOW PRODUCED BY EXTRAVASATION OF BLOOD—YELLOW TINOE OF MUCUS, AND OF ONE CLASS OF ADVENTITIOUS DEPOSIT.—GREEN, AS AN ANIMAL COLOUR —GREENNESS FREQUENTLY CADAVERIC, BUT SEEN DURING LIFE IN VEINS BORDERING ON CANCER, IN THE EXPECTORATION, IN PUS, IN CHLOROSIS, IN ICTERUS.—CYSTIC OXYD—BLUE—BLUENESS OF VEINS—CYANOSIS.—BROWN —LILAC.—WHITENESS—CASES IN WHICH WHITENESS IS OBSERVED; IN THE EMBRYO—IN STRUCTURES NATURALLY WHITE—IN THE SKIN, CELLULAR MEMBRANE, &c. — IN STRUCTURES WHICH HAVE CEASED TO CONVEY RED BLOOD, AS FALSE MEMBRANES, ATROPHIED ORGANS, TISSUES WHICH HAVE BEEN INFLAMED OR INJURED, &c.—WHITE CONSOLIDATION OF LUNG—MEANING OF THE TERM 'LARDACEOUS SUBSTANCE'—WHITENESS OF SOME MALIGNANT GROWTHS — MOTTLED KIDNEYS — WHITENESS OF TUBERCULAR DEPOSIT—WHITE SECRETIONS, FROM THE MAMMARY GLANDS, FROM THE SEROUS MEMBRANES, FROM THE MUCOUS MEMBRANE OF THE ALIMENTARY CANAL, FALLOPIAN TUBES, AND AIR-PASSAGES— WHITE SECRETIONS ALLIED TO TUBERCULAR MATTER.

GENTLEMEN,

BEFORE I proceed to describe two other forms of malignant disease, namely, cirrosis and melanosis, of which the names and most striking distinctive characters are derived from their peculiar colours, it appears to me desirable to make some observations on the subject of colours as we find them exhibited in the human tissues in health and disease, in order that we may correctly appreciate the value of distinctions in morbid anatomy founded upon this attribute.— Although it is my intention to speak of those colours only

Introduction of the subject of colours .

which may be met with in the human body, yet I shall avail myself of any illustrations taken from other animals, which may present the same colour, under such particular circumstances as to supply us with interesting facts bearing on the subject.

Assumption made, that all colours are derived from the blood.

Not having any speculative opinions or new chemical facts to offer with respect to the constituent principles which colour the tissues and fluids of animals, I shall assume that they are derived from the blood, and bear a certain degree of relationship to each other. Their formation, probably, does not require any complicated secreting apparatus; and there are reasons to warrant our believing, with respect to some of them at least, that certain physical conditions operate to occasion their production. The familiar instance of a bruise will illustrate two of the points which I have alluded to. Within a very limited space, and in a very short time, we see a variety of colours produced; whence we may infer both the near relation of the colouring principles, and the simplicity of the apparatus essential to their production.

Colours most frequently occurring.

In the higher classes of animals, red, in some shade or other, appears to be the colour the most readily and healthily produced. We find it in the embryo, or its appendages, in a very few hours after its developement has commenced; and the animal continues to be coloured by its vivifying and nutrient fluid, as long as life exists. Whilst this fluid still retains its name of blood, and holds its natural situation in the vessels, we know that the colour may pass from the brightest to the deepest red, acquire a livid or purplish tinge, and thence proceed, through deepening shades of purple and livid, to absolute black. I shall therefore commence with red; and notice the other colours which I have mentioned in succession. Green and yellow are more rarely met with; and the changes which they present, in their derivation from the blood, are less evident and traceable, than in the cases of purple and black.

We not only find a red colour in the first-formed vessels

of the fœtal membranes, but, in the developed animal, the chyle and lymph, by which the blood is to be recruited, often assume a faint tinge of this colour. It has been ascribed to iron by several animal chemists. The late Professor Vauquelin, in a Course of Lectures on Animal Chemistry, which I attended, attributed the colour of the blood to a peculiar animal principle; and this idea is adopted by other chemists. 'Hæmatosin' is the name by which this principle is known. Dr. Stevens has paid great attention to the changes of tint which this colouring matter exhibits by a mixture with different chemical re-agents. He states, that both acids and alkalies occasion it to assume a dark colour; which, with the stronger acids, amounts nearly or quite to black, except in the case of carbonic acid. The dark colour imparted to the blood is permanent; but when carbonic acid is removed from the blood, it may resume its bright colour. The transition from arterial to venous blood is, I conceive, with great probability, ascribed to the addition of carbonic acid to the arterial blood. The property of imparting a dark colour to the blood, which acids possess, has long been noticed by those who have paid attention to animal chemistry. This was particularly the case with Drs. Coindet and Christison, and with Dr. Perry of Lausanne. It might have been supposed that nitric acid, from the large quantity of oxygen which it contains, would have formed an exception. This, however, does not appear to be the case, if we may judge from the experiment of Dr. Combe, the author of an elaborate experimental Essay on the effects of nitro-muriatic acid on the system.—The power of neutral salts, and especially those of the serum, to give a bright red to the colouring matter of the blood, may be seen in cases where there is no complication with the admission of oxygen. A patient in this Hospital, who laboured under ovarian dropsy, was tapped; and the fluid evacuated was serous, without being ropy from albumen or mucus. It was slightly sanguinolent. The colouring matter, which

was of arterial red, immediately subsided as a sediment closely resembling vermilion.—But let the precise mode in which arterial is converted into venous blood be what it may, the fact, as respects the subject before us, remains the same. The blood delayed in its vessels acquires a deeper colour, as every one knows who has seen a part subjected to temporary strangulation. A similar alteration of colour may take place in blood which has escaped from its vessels; as we see in bruised eyes and sanguineous apoplexy. From these considerations, we may be warranted in concluding, when we find a part preternaturally livid, that the blood has, from some cause or other, been retarded or removed from those influences which are destined to restore and maintain its arterial character.

Indications afforded by purple colour in *post-mortem* examinations.

A purple or livid colour is often discovered in the examination of diseased appearances, and is occasionally the most striking circumstance which arrests our notice. We must not, however, at once admit it as a proof either of inflammation or congestion. Before we can decide as to the value and importance to be ascribed to this appearance, we must be aware of the mode of the patient's death, and of the position in which the body had lain, either subsequently to death, or a short time before it took place. If the deep purple or livid colour concur with distension of the veins, if the parts have had an inferior or depending position, and the cellular structure of the part be little if at all altered, as to form or lacerability, we may infer that the appearance, if not purely cadaveric, is at least the effect of a congestion that has taken place a short time before death. If the effect had been produced either by an inflammatory or passive congestion, or even by extravasation, there would be both an alteration of texture, and the modification of colour corresponding with it.

Black colour of the blood.

When blood has been long retained in small vessels, it frequently acquires, instead of a dark purple, a positively black colour. Some years ago, I suggested that the retar-

dation of the blood was one cause of this colour; and I see
no reason to recede from that opinion, since the cases in
which it is met with seem, without exception, to favour it.
We occasionally find it, to a greater or less extent, in the
serous membranes, where inflammation has taken place, but
has subsided before death. When, in these cases, the quan-
tity of black matter is very small, we may easily be satisfied
that it depends on an alteration of the blood in the vessels,
since it marks their ramifications as distinctly as when they
are injected with red blood. This appearance may often
be noticed, forming greyish areolæ around spots where a
partial adhesion has taken place, and more especially around
small tubercles beneath the serous membranes. I believe
that, in these cases, the vessels, which, during the existence
of inflammation, were distended with red blood, have not
had sufficient tone, on the subsidence of the inflammation, to
return to their original size, and consequently have allowed
a small quantity of blood to remain stagnant in them.
Sometimes, instead of a few grey and black spots, a consi-   Production
derable extent of serous membrane, with the cellular mem-   of black
                                                              matter in
brane beneath it, and the false membrane, if such should   serous
have been formed on its surface, are deeply coloured, and   membranes.
loaded with black matter, after the subsidence of inflamma-
tion. Such instances have, I believe, not unfrequently
been described as cases of melanosis; and one of my prin-
cipal reasons for bringing forward the subject of colour
now, is, to make sensible the difference which I conceive to
exist between these cases, and those of true melanosis, which
I shall subsequently have to describe to you. The case of
E. Bindle, already narrated (p. 234), will serve to illustrate
the extent to which this deposition of black may take place,
after peritonitis. The production of black matter, whether
to a large or small extent, is certainly much more common
in the peritoneum, than in the other serous membranes:
nevertheless, I have seen it repeatedly in the pleuræ, and
occasionally in connection with the arachnoid.

It is not only necessary to distinguish this black matter,

Black co-
lour pro-
duced by
sulphuretted
hydrogen.

when it occurs simply, from those cases of malignant disease constituting melanosis, but it is also necessary not to confound with it those cases in which a dark colour has been produced by sulphuretted hydrogen, where it is almost always to be regarded as a cadaveric appearance.   In general, this cadaveric colour is more uniformly diffused than the dark colour produced by the mere stagnation of blood in the vessels; and its colour has more of a leaden hue, than of a perfect carbonaceous black, which we meet with in the preceding cases: yet it must be admitted, that, at times, the distinction is not easily made.   Both cases so far resemble each other, that they are to be ascribed to an alteration of the colouring matter in the blood; but in the cadaveric appearance, the blood, already altered in character, has generally transuded and soaked the tissue, which then becomes uniformly discoloured.

Production
of black
matter in
mucous
membranes.

The production of black matter is by no means uncommon in the mucous membranes: but in this situation it is more difficult to distinguish the black colour produced by stains of the blood, from that which is caused by sulphuretted hydrogen; since, even when proceeding from this latter cause, it may be distinctly situated in the vessels.   In the mucous membrane some of the best examples of the productions of black pigment, from delay of the blood, are found in connection with the cicatrices of old ulcers of the intestines.   It may also be seen forming arborescent areolæ around the mucous follicles, when they have been inflamed : and it may be met with in almost every part of the mucous membrane itself, both in the large and small intestines.   It sometimes occurs in extremely minute points, requiring very close inspection, or even the assistance of a glass to view them separately, and producing, by their number and proximity, various shades of grey : in other cases it is much more abundant.   In these examples, it is not very unfrequent to observe one part of a small vessel quite black, whilst another portion is of a deep-red or purple.

The black, grey, and slate-coloured hues presented by

the mucous membranes, and more especially by that of the alimentary canal, have been insisted upon by two very distinguished French pathologists, Andral and Dalmas, jun., as indicative of chronic inflammation of the parts so affected. This colour may, it is true, be often accompanied by some alteration of texture, resulting from inflammation; but I believe that the inflammatory process must have subsided when the discoloration takes place, and that it may long continue when inflammation is at an end. My friend Dr. Bright has adopted the same conclusion, which he has stated in the first part of his magnificent work. I shall have occasion again to notice this subject, in treating of the morbid anatomy of the mucous membrane.

The production of black matter is perhaps no where more frequent than in the lungs; where it is almost invariably met with, except in very young subjects, and is known by the name of black pulmonary matter. It is sometimes so abundant, as almost to form the sole colour of the lung. Laennec has strongly insisted on the importance of distinguishing this state of the lung from that dependent on melanosis. In many, and perhaps in most instances, it is probably an effect slowly and gradually produced; yet even in these cases it is, perhaps, to be attributed to some slight impediment to respiration, interfering with the separation of carbon from the blood. In other cases in which it occurs more abundantly, but less uniformly, it is to be regarded as a sequel, either to pulmonary apoplexy, or to pneumonia, which has produced red hepatization. These cases of black matter produced within the body must not be confounded with those in which the accumulation of black matter is the result of carbonaceous matter received with the inspired air, of which striking examples have been published by the late Dr. J. C. Gregory and Dr. W. Thomson.

Black matter not unfrequently finds its way into the air-passages; and is thrown off, during life, intimately intermixed with the sputa: it appears to be the effect of a con-

gested state of the lungs and bronchial membrane. I was
particularly struck with it in the case of a plethoric young
woman, who was labouring under a pulmonary catarrh, in
conjunction with amenorrhœa: and I can at any time pro-
duce the same appearance in my own person, by long con-
tinued quick running, which has the effect of forcibly in-
jecting the mucous membrane of the air-passages.   Sputa,
thus discoloured, have been by some persons attributed to
the bronchial glands; but I am not aware of any glands
which secrete black matter, and communicate with the air-
passages.   I have never seen the follicles of this mucous
membrane discoloured with black matter ; but the mucous
membrane itself may be so.   The synovial membranes of
the sheaths of tendons are occasionally discoloured with
small spots of black matter, which, as in the case of the
serous and mucous membranes, may frequently be seen
to be situated in small vessels.

Black mat-
ter in the
bronchial
glands.

I shall now proceed to notice the cases in which black
matter occurs in more solid textures.   The bronchial
glands unquestionably claim to be mentioned among the
first of these.   The occurrence of black matter in these
bodies is so very frequent, that it can scarcely be regarded
as abnormal; and the inconvenience, if any, which results
from it, is so slight, as to escape attention.   From the
situation and office of these glands, there is certainly some
reason to suspect that they receive their black matter from
the lungs; since we have already seen, that the black pig-
ment is extensively produced in these organs, and the
glands themselves do not appear to receive so large a quan-
tity of blood, or to be subject to those congestions which
I believe are principal causes of the production of this
matter.   On the other hand, I know of no proof of the
black matter being taken up by lymphatic vessels; and the
analogy of many other colouring substances is against it.
It must however be remembered, that if very small and
imperceptible quantities were taken up, it would, in process

of time, be sufficient to produce the effect which we find, provided it were arrested in its progress through the gland.

The absorbent glands in the abdomen sometimes afford an example of a partial, but rarely of a complete colouring from this pigment. It is natural, though in a very small quantity, in the crura cerebri, causing what is called the locus niger; although, in this situation, it is so diluted as to appear rather grey than black. We do not often meet with a black pigment diffused in the substance of solid parts, except in conjunction with that peculiar form of malignant disease to which the name of melanosis is given;—the consideration of which I defer for the present. Black matter is, however, sometimes met with in a diffused form in the cellular structure, as a sequel to extravasation of blood: the vascular membranes which enclose encephaloid tumors sometimes acquire a black colour, and form a connecting link between this variety of malignant disease and melanosis. In the inferior animals we find a deposition of black matter in internal parts, independently of any morbid action. In sheep, the membranes of the brain at the anterior part, especially about the olfactory nerves, are often pervaded with black matter. The presence of this pigment in the periosteum of Guinea-fowls is another instance, which is quite notorious.

Although I believe the production of black matter to be very much, and perhaps principally, promoted by local causes, affecting the circulation of the blood in the parts in which it is met with, yet I believe that there is a particular state of the constitution which favours the production of the pigment. To a slight extent this may be natural, and may merely occasion a dark complexion, dark eyes, and dark appendices to the skin, as in the cases noticed in the paper of Heusinger. This natural state of the constitution is sometimes considerably increased, and in other cases apparently produced, by disease. In some affections of the

Marginal notes:

Production of black matter in glands in the abdomen;—

in the crura cerebri;—

in cellular membrane;—

in inferior animals.

Conditions favourable to the production of black matter.

heart, for example, I have known the skin to assume a
swarthy appearance, from an increased quantity of colour-
ing matter in the rete mucosum; the increased deposi-
tion taking place in those parts of the skin which are natu-
rally of the deepest colour, such as the axillæ and neigh-
bourhood of the nipples; and also in parts exposed to the
atmosphere, such as the neck and arms. The affections of
the heart, to which I have alluded as producing this effect,
are such as are calculated to create a languid circulation;
and are rather connected with the muscular substance than
with the valvular apparatus.

Dark colour
produced by
terror.

A similar dark colour of the skin has been suddenly pro-
duced by the influence of terror. Professor Rostan has
noticed some cases of this kind; the most remarkable of
which was that of a female, who, during the horrors of the
French Revolution, was condemned to the guillotine. She
was reprieved, but the shock which she had received occa-
sioned her skin to become very dark. It remained in this
state till her death, which occurred some years afterwards.
A careful examination of the texture of the skin discovered
that its blackness was produced by a deposit of pigment in
that part of the tissue in which its presence is natural in
the dark races of mankind.

There is another form of constitutional tendency to the
production of this matter, which is much more striking, and
occasions more or less deep discoloration of internal parts,
especially of such as are membranous. It is probably
closely allied to scorbutus, or purpura hæmorrhagica, and
perhaps most frequently concurs with true melanosis. It
may either be the cause, or the effect, of the peculiar form
of that malignant disease; but I believe it may exist solely
as a discoloration of natural and pre-existing parts, unac-
companied by any adventitious structure. The records of
such cases are mixed up, and confounded with, those
of true melanosis: but it is quite essential to establish a
distinction between them.

The next colour of which I shall speak, is yellow. In the human subject, this colour is rarely if ever met with as that of a tissue, except as a pathological appearance : for I can scarcely regard the yellow colour of fat, of elastic liga- ment, and, in some degree, of the coats of arteries, as con- nected, either with the bile, or the peculiar pigment of which I am at present to speak. It is well known that many of the tissues of the body, as well as the fluids, may acquire a yellow colour in jaundice ; and the cause of this appearance is, without difficulty, traced to the presence of bile in the blood. Of the characteristic production of this colour in yellow fever, I have nothing to offer from perso- nal observation ; and do not know whether it may be re- garded as dependent on bile, or not. There is, however, in some unhealthy conditions of the system, a more or less general sallowness of the skin, which appears to be caused by the presence of a small quantity of colouring matter, without being at all dependent on the diffusion of bile through the system. We sometimes see it in the cachectic state, which accompanies cancer ; but it may exist inde- pendently of that disease.

I shall now proceed to notice cases in which the yellow colouring matter is met with in a more aggregate and tan- gible form than in the preceding instances. When an ex- tensive bruise has been inflicted on any part of the surface of the body—amongst the variety of hues which, in the course of a few days, the injured spot may assume, yellow is often one of the most conspicuous. It probably, in part, depends on extravasated blood ; though I believe that, in these cases, it is seldom observed in those parts in which the extravasation is most considerable ; but, on the contrary, about the circumference, where it fades away into the sur- rounding healthy skin. When blood has been extravasated to a larger amount in the interior of the body, it is by no means uncommon to see a portion of the coagulum assume a yellowish colour, somewhat like that of ochre, and thence

passing into orange or reddish brown. I have seen this
colour in a sanguineous tumor, removed from the fleshy part
of a limb. It may also be seen in the lung, after pulmo-
nary apoplexy; and, if we may judge from the histories of
the cases in which it was met with, it would seem that the
change in the coagulum from red to yellow is a slow pro-
cess. To this circumstance I wish particular attention to
be paid, as some inferences of practical importance may be
deduced from it. The most striking instances of the pro-
duction of this colour are those which we meet with in the
brain, after sanguineous apoplexy, which, if the patient sur-
vive a considerable time, gives rise to an ochre-yellow cyst,
which has been particularly described by Riobe and Ro-
choux. Spots of the same colour also occur on the surface
of the brain, when fatal injuries to the head have not caused
immediate death: they are probably produced by extra-
vasation of blood from the pia mater. A similar colour is
likewise met with in some cases of softening of the brain.
It may be queried, whether this remarkable disposition to
the production of yellow matter, which certainly occurs in
the brain, is wholly to be ascribed to the situation in which
the effused blood is placed? or whether something be due
to the admixture of cerebral substance with it?

Yellow
tinge of
secretions
from mu-
cous mem-
branes.

The secretion from the mucous membranes is liable to be
slightly tinged with yellow; which is far from being an un-
common case. It is, in some cases, of a bright camboge-
yellow colour. I believe that such appearances are generally
the result of a high degree of active inflammatory action, and
are very closely allied to those cases in which the secretion
becomes very slightly but diffusively sanguinolent. I have
not only made observations on which this idea is founded;
but in an instance which came under my notice, in which
the yellow colour of the mucus was the most striking and
remarkable, its production was preceded by intense pain,
and other symptoms of inflammation in the frontal sinuses.

The adventitious structures which I have comprised under

the varieties of fungoid disease are sometimes coloured
with yellow; as I shall have occasion to notice, in speaking
of cirrosis, a form of malignant disease described by Laen-
nec. The membranes of the brain and spinal chord have
been found of a slightly yellow colour, in a fœtus dissected
by Lobstein, and recorded in Breschet's Repertory of Sur-
gery and Pathological Anatomy. This author gives the
affection producing these cases the name of ' Kirronose';
but it differs essentially from that to which Laennec has
given a similar appellation.

Though green is by no means a common colour in a
living or very recently dead human subject, either in health
or disease, yet it must not be wholly passed over; since it
is not only pretty frequent amongst cadaveric appearances,
but is occasionally met with in our tissues and fluids, as
well as in those of inferior animals. Like the colours of
which I have been speaking, it is produced as one of the
effects of a superficial bruise. It is very abundant, and per-
fectly natural, in the maternal part of the placenta of the dog.
I examined some taken from that situation, and found it to
be a very intense pigment, susceptible of much dilution,
and not materially altered either by alkalies or several
acids. Its appearance very much resembled that of sap-
green, like which, when condensed, it appeared nearly
black. There is a small slender fish, the hornpike, found
in company with mackarel, and at some seasons not uncom-
mon in the London market, the bones of which are of a
brightish-green colour, more especially in those parts of
the bones which in other fish are of a red colour. From
this, as well as from the preceding instances, we may infer,
that this colour, like the black and yellow pigments, is de-
duced by an easy transition from the colouring matter of
blood.

Of green, as an animal colour.

As a cadaveric appearance, we sometimes meet with this
colour, of a beautiful and delicate shade, in the muscles,
which in life owe their red colour directly, as well as indi-

Green, as a cadaveric appearance.

rectly, to the blood. A green tinge is not unfrequently met with, after death, in the mucous membrane of the alimentary canal and bronchial tubes. Though in this situation, as well as in the muscles, it may be a cadaveric appearance, I suspect, for reasons which I shall presently offer, that it sometimes exists during life. When the surface of the body, after death, presents a green colour, it takes place in those parts in which there are either cadaveric congestions, or in the neighbourhood of considerable veins.

Green colour of fluids during life.

As instances of the fluids acquiring this colour during life, I may mention the blood of the veins in the neighbourhood of some cancerous tumors becoming of a dingy green, approaching to olive. This has probably been seen, by most surgeons, in the removal of the mamma, for malignant disease. The sputa rejected from the air-passages, in some cases of catarrh, not unfrequently put on a greenish colour, at which fanciful patients are apt to be more or less alarmed : there is, however, no cause for these feelings, but, on the contrary, we may infer, from the sputum presenting this colour, that the irritation of the affected membrane is subsiding. It is from these cases of green-coloured sputum that I am induced to suspect that the greenish colour of the bronchial membrane, which we occasionally meet with, is not necessarily cadaveric, but may have occurred during life; for I have repeatedly observed the mucus, lubricating a part, to be of the same hue with the part which it covers. Pus is occasionally of a greenish colour. This is, perhaps, most strikingly met with within the cranium, where it may either exist in pus beneath the arachnoid, and infiltrating the pia mater, or in abscesses in the substance of the brain. The softened brain substance, which sometimes assumes in a great measure the character of abscess, is also, in some

Green colour in chlorosis.

instances, of a greenish colour. The approach to a green hue, in patients who are labouring under chlorosis, is probably dependent, in part, on the fluids, and in part on the

solids; but I have no positive facts to offer in connection with this affection, except that, on one occasion, I observed blood drawn from a chlorotic female to be of a dingy colour, and to be covered, after coagulation, with a thin dirty buff.

Almost every one must have repeatedly seen the serum, when separated from the crassamentum, of a yellowish green colour: but as this may have been owing to an admixture of bile, I do not wish to urge its connection with the cases which I have been mentioning; since it may rather belong to the following cases, in which the green colour is decidedly referrible to bile. Every one who has been in the habit of witnessing inspections, must have repeatedly observed the bile in the gall-bladder to be of a green or olive colour, instead of yellow; and the coats of the gall-bladder to have assumed the same colour: whilst it is much more uncommon to find that the bile in the ducts of the liver has lost its yellow colour: hence I think we may infer, that the greenness has often been acquired after the bile has been secreted. In other instances, the bile appears to assume even a bright-green colour from intermixture with the contents of the alimentary canal, as may frequently be seen in cases of bilious vomiting. When the bile is obstructed in its course to the intestines, the communications between the ducts and sanguiferous vessels of the liver are sufficiently ready to allow of the bile passing rapidly into the circulation, and colouring the different parts of the body, which, in consequence, generally assume a yellow colour, constituting what is termed jaundice. The colour so communicated, it is well known, is not always yellow, but occasionally olive or greenish. It would not be easy to determine, *à priori*, whether the greenness in these instances is to be referred to alteration in the bile, by admixtures to which it may be exposed after leaving the liver; or whether the bile has already assumed this colour before its diffusion. Experience has taught us, however, that this

Green colour dependent on the presence of bile.

Icterus.

deviation from the ordinary colour of jaundice belongs to
those cases in which the obstruction is the most obstinate,
and in which we often find, in examination after death, per-
manent obstruction to the principal ducts, which are greatly
dilated; and that the smaller ducts have likewise their pe-
culiar obstructions.   Fungoid tubercles, scattered through
the substance of the liver, are the most common causes of
this obstruction : the substance of the liver is, at the same
time, deeply tinged with olive-coloured bile. If, in conjunc-
tion with the chronic character of these cases, we revert to
the fact before noticed, that the bile is often of a greenish
colour in the gall-bladder, whilst it is yellow in the hepatic
ducts, we shall, I conceive, find a further confirmation of
our suspicion that the bile may acquire this colour by re-
tention.   In some cases in which the smaller gall-ducts
have their peculiar obstacles, we may find partial accumu-
lations in cavities in the substance of the liver, in which the
bile is thick and grumous, and of the colour of mineral
green; whilst the bile in the unobstructed ducts may con-
tinue yellow.   In the cases of fungoid tubercles of the
liver, the retention takes place in the liver itself: the bile
becomes green: the substance of the liver, like the coats of
the gall-bladder, acquires the same colour: and when this
effect has taken place, the bile is probably secreted no
longer of a yellow, but of a greenish colour.

Fungoid disease is the most frequent cause of the green jaundice.

Cystic oxyd.   That rare variety of urinary calculus to which Dr. Wol-
laston gave the name of ' cystic oxyd,' but which has since
been known to be formed in the kidneys, is generally, if
not invariably, of a crystalline form, and, when recent, of a
wine or wax-yellow colour. By exposure to light, this
yellow is converted into green, in which, after a conside-
rable time, blue predominates.

Blue, as an animal co-lour.   Although we occasionally see some parts of the human
subject, and very frequently particular parts of some inferior
animals, presenting a blue colour, yet I am not aware of a
single instance in which this colour appears to belong to the

tissue itself.   It seems rather to depend on the colour of the
blood in the vessels of the parts which present it; yet the
blood itself, which occasions this colour, is perhaps never
blue.   The fact appears to be, that when the blood has
passed from the state of arterial to venous, and become of
a decidedly purple colour, the tissues of parts apparently
blue, although translucent, do not transmit all the elements
of purple light, but suffer the blue rays to pass in pre-
ference to the red.   I believe that the parts which gene-
rally present the blue colour, from this cause, are in reality
nearly white.   Almost every one must be aware that the
superficial veins, when in 'a turgid state, are readily distin-
guished, not only by their prominence, but by their blueish
colour.   The same thing may be seen in deeper-seated
veins, when laid bare in operation : but if the venous tissue
be remarkably thin and transparent, the veins will exhibit
the purple colour of the blood it conveys.   It is not uncom-
mon to see the lips of a deep blue colour in persons
affected with very severe bronchitis; but this appearance is
most remarkable in those individuals who labour under
some malformation of the heart, more especially a defi-
ciency either in the septum of the auricles, or that of the
ventricles.   It is well known, that in these last cases the
blue colour is not confined to the lips, or even to the
countenance, but extends to every other part of the surface
capable of receiving a considerable quantity of blood; in
so much, that the terms ' blue disease' and ' cyanosis' are
applied to them.   In all of these cases, the blue colour is
occasioned by the diffusion of highly venous blood seen
through the nearly-colourless tissue interposed between it
and the eye.   It is most conspicuous in the lips, not only
because the membrane covering them invests a highly vas-
cular structure, but because, from its thinness, it does not
conceal those small vessels which would be imperceptible
beneath the integuments of other parts.

Amongst the inferior animals, I can adduce no more

Blueness of
the surface
in bronchitis
and heart-
disease.

familiar and striking instance of the occurrence of the blue
colour, than that which is presented by the neck of the com-
mon turkey-cock. When this animal is dead, the unfledged
skin which covers the caruncles about his neck appears to be
of a dead white; but during life, they appear either white,
red, or blue, according as it remains nearly exsanguine, or is
injected with arterial or venous blood. The oblong naked
spots on the cheeks of the mandril are remarkable for the
bright blue colour which they present, and which, I sup-
pose, is produced in the same manner as that in the turkey-
cock's neck.

I have now mentioned the principal facts which occur to
me respecting the most important appearances presented
by colour in our tissues and fluids. There are, of course,
many varieties of shades and intermediate hues which it is
needless for me to attempt to particularize, but there are
Brown, as two or three which claim some attention. Thus there are
an animal
colour. different shades of brown which we meet with where blood
has been effused or congested. These appear to result
from the intermixture of some portions which are passing
into the yellow colour with others which still retain the
character of dark blood. This kind of brown is not an un-
frequent colour in cerebral apoplexy : it is also seen in pul-
monary apoplexy, and in sanguineous tumors. In a tumor
of this kind removed by my friend T. Callaway, the larger
portion of extravasated blood had acquired a tan colour;
whilst a smaller portion, apparently of much longer stand-
ing, was nearly colourless. I have had occasion to notice
what appeared to me a remarkable fact connected with the
dark-brown and nearly black colouring matter occasionally
produced in particular parts, and resulting apparently
from partial gangrene, or a state approaching to it. In the
cases to which I allude, not only the solid parts, but the
fluids infiltrating them, were deeply coloured. These fluids
had the effect of fixing an indelible stain upon the skin and
nails of the fingers, almost resembling that from nitrate of

silver, or nitrate of quicksilver. In a case of this kind, a stain in the latter situation remained for nearly two months.

Another colour which I must allude to, is lilac, or a near approach to it. The most striking examples of this colour are met with in some cases where the spleen is greatly softened; and in which this state cannot be ascribed to a cadaveric change, since it is met with in the most recent inspections, and whilst the warmth of the subject is still considerable. I believe it is to be ascribed to the dilution of purple blood with a soft, opake, colourless deposit, probably of an inflammatory character. The lilac colour is also occasionally met with in those globular masses which are attached to the internal surface of the heart, and are membranous externally, and of a grumous consistence internally. They appear to be principally formed by the fibrin of the blood; but the coloured particles are not wholly absent: hence the colour of the grumous mass, as in the case of the softened spleen, may be attributed to the colouring matter of the blood, diluted with opaque whitish matter, in a softened state.

Lilac, as an animal colour.

I must not quit the subject of colour, without noticing whiteness, as it presents itself both in solid parts and secretions. It will not be enough simply to ascribe this to the absence of the colouring matter; but it will be necessary to inquire into the circumstances which promote or attend its absence. 1. In the earliest periods of existence, colouring matter is absent, not having yet been produced. 2. After the colouring matter has been formed, there are still some parts which, in their natural state, do not require the colouring matter to penetrate them. 3. Others receive but little colouring matter; and this is so slightly retained in the tissue, that it is only visible during life, and whilst the circulation is pretty active; but the part appears quite pale after death, or when the circulation is languid, and the quantity of blood in the system reduced. 4. There are, again, other parts, both amongst those natural to the body, and those

Whiteness of tissues.

which are occasionally added to it by adventitious production, which at first receive the red blood, but eventually cease to do so, and present a white colour.

1. Paleness of the embryo.

Of the paleness attendant on the first periods of existence, I need say nothing; except to remark, that in a very few hours, scarcely twenty-four, the appearance of colouring matter may be seen in the case of oviparous animals: nevertheless, several days must elapse before the colouring matter is at all diffused through the embryo.

2. Persistant whiteness of cartilage &c.

As instances of the second class, or of structures into which colouring matter does not enter, though it may have been produced in the body, I may point out articular cartilage, fibro-cartilage, elastic ligament, and enamel.

3. Whiteness of skin, cellular membrane, &c.

Almost every part of the surface of the body may be adduced as an instance of the third class; in which parts receive colour when the circulation is active, but become pale when it is languid, or ceases. This is very manifest in most parts of the skin. Such is also the case with the cellular membrane; for, though susceptible of being intensely reddened by injection, it allows the complete retirement of the red particles from its vessels, and becomes white or colourless. Every one must be familiar with its snowy whiteness, or rather foam-like appearance, as it is exhibited in recently-killed veal. There are many parts which retain the colour which they owe to the injection of their vessels, much more strongly than the skin and the cellular membrane; so strongly indeed, that the colour almost appears fixed in and essential to them; which, when the system has been slowly and almost completely deprived of blood, constituting a state which is described as general anæmia, become pale, and nearly white. This is sometimes strikingly the case with the kidneys; and as it more often occurs in a part than in the whole of the organ, it produces a mottled appearance; which it is important not to confound with the mottled and light-coloured appearance of the kidney occasioned by a morbid change, which has been

described by Dr. Bright. The tongue and the lips frequently, the corpora cavernosa occasionally, and even the thyroid gland, may become pale in this manner.

The fourth class, or those which, having originally possessed red vessels, subsequently cease to do so, present matter of more pathological interest than any of the preceding classes. The best instance I can adduce from the normal state of the body, is furnished by the eye; in which, in the fœtal state, it is well known that a red vessel occupies a situation which, in the perfect animal, requires the most complete transparency. A process similar to that which, about the period of birth, removes this small branch of the arteria centralis retinæ, takes place in many newly-formed parts; which, though at first highly vascular, and consequently redder than many other tissues, ultimately become nearly or quite white, from the diminution and obliteration of their vessels. This is conspicuously seen on the surface of the body after extensive burns which have caused deep ulceration. The same thing, as I have already observed, is also seen in false membranes formed on the serous membranes; which, when first organized, are often copiously supplied with red vessels, so as to give them, at times, almost the appearance of muscle; yet, eventually, these membranes become pale, and nearly or quite white. Though, on the serous membranes, these false membranes frequently assume, in their permanent state, all the characters of cellular membrane, yet, as we have seen, they exhibit, in other instances, every variety of texture, up to fibro-cartilage, and even bone. In other situations, the adventitious product of inflammation is generally found in a condensed and solid form, rather than in that of cellular membrane. In its permanent state, it loses its sensible vascularity, and becomes of a white colour, constituting what Laennec calls ' tissue blanc non fibreux.' This is also the structure into which several parts natural to the body resolve themselves, when their nutrition is modified on their ceasing to serve

4. Whiteness of parts which have ceased to carry red blood.

Whiteness of old false membranes.

Whiteness of atrophied structures.

any useful purpose in the animal economy. The ductus arteriosus, the round ligament of the liver, the urachus, the remnants of the thymus gland, naturally degenerate into this tissue : and the same change may happen to parts which, from some accidental cause, have ceased to perform their function ; as, for example, obliterated arteries and veins, and even more solid structures, as the kidney, testicle, or ovary. It is this same structure which presents the whiteness so conspicuous in cicatrices ; both those which are presented during life on the surface of the body, and such as are formed internally in organs or parts injured by disease or accident.   Some of the best examples of this kind are furnished by the liver, spleen, kidneys, and lungs.   The contracted parietes of an old abscess, which has long since ceased to secrete, and is either closed on itself, or incloses the inert and solid remains of its inorganizable secretion, generally consist of the same substance, and, for the most part, present a white colour.   It may however happen, that this white ground is tinged by the presence of some of the colouring matters which I have already described, more especially the black and the yellow.

Whiteness of organs after injury or disease.

Whiteness is sometimes the result of the disappearance of colouring matter, even when it does not seem to have been contained in vessels, and when the blanching cannot be attributed to their obliteration.   Without attempting to explain the process by which this takes place, I shall merely illustrate, by examples, the cases in which it occurs.   I have already had occasion to notice the transition from red to brown and yellow, which is known to take place in extravasated blood, and in parts deeply coloured by blood in this state.   It sometimes happens, that these colours become progressively paler, until the solid substance presents almost absolute whiteness.   A very striking instance of this kind occurred in a small sub-cutaneous tumor in the thigh, which was removed by my friend T. Callaway, and which evidently depended on extravasated blood.   The indurated and

Whiteness following extravasation of blood.

defined portions of spleen resulting from violence, which I
have noticed in a paper laid before the Royal Medical and
Chirurgical Society, and which generally present a shade
of brown, sometimes pass into white; but they are then
remarkably firm and contracted, and, in fact, appear to have
become specimens of the non-fibrous white tissue already
mentioned. It is in the lungs that whiteness, of the kind of   White con-
which I am now speaking, is of the most interest, as a patho-   solidation of
logical appearance. It is not, however, as a pure white   pulmonary
                                                               texture.
that it is often presented to our view in this organ : it is
more frequently dashed with red, or grey, or black pulmonary
matter. The consolidation of the lungs has been commonly
described as red, grey, or white hepatization. It is not,
however, every form of the white and the grey consolidation,
as Andral more correctly calls it, which is to be regarded
as the result of a transition of the kind of which I am
speaking. I wish to be understood as excluding those cases
in which the consolidating effusion appears to have been
originally white; and also those cases which are correctly
regarded as occasioned by tuberculous infiltration. When
these cases are set aside, there will yet remain others, of
grey or white consolidation; in which, so far as we can
judge from a careful examination of different parts of the
same lung, it appears that the portions which are white, or
of a light colour, had been previously red. We may, in
fact, find different portions of the inflamed lung presenting
most of the steps of the transition. I think, however, I am
correct in stating, that the preceding redness in these cases
is generally lighter and brighter than that exhibited by
other forms of red consolidation, which are often so deep
and dark as closely to resemble cadaveric infiltration, or
even pulmonary apoplexy.

There are two or three other white or light-coloured
solid productions, which claim a little attention, before
I notice the white fluids or secretions. There is a   Lardaceous
substance not unfrequently mentioned by pathological   tissue.

anatomists, but more especially those of foreign schools,
under the name of 'lardaceous matter,' from its supposed
resemblance, both in texture and colour, to the white
fat of bacon.   I confess that I am not able very confi-
dently to define the meaning of this term; but I conceive it
to be used to designate, First, one of the forms of the
product of inflammation which I have already described to
you, in treating of the serous membranes.   It appears to be
intermediate, between the inorganizable and plastic forms:
like the latter, it is concrete and coherent, but to an inferior
degree, being accompanied with a kind of friability, or short-
ness, which probably constitutes a part of its supposed
resemblance to the fat of bacon.   It might, for the same
reason, be almost as aptly compared to raw turnip, or some
other vegetable substance; one or other simile being more
expressive, according to differences of appearance which
the lardaceous substance itself may present.   On the other
hand, it approaches to the former or non-plastic form of
inflammation, in its insusceptibility of organization : hence
it is ill adapted to continue as a permanent structure; whilst,
from its texture being unyielding, compared with that of
adventitious cellular membrane, it affords far more serious
impediment to the performance of functions in those organs
about which it is deposited.   I believe it to be closely allied to
those deposits which are regarded as of scrofulous character,
if it be not more correct to place it absolutely in that class.
When it exists in no great quantity, and is accompanied by
deposit of a more plastic character, I believe it may become,
to a certain degree, permanent, and cease to be a cause of
inflammatory irritation.   In such cases, it would be likely
to assume the character of fibro-cartilage.   The only situ-
ations in which this form of lardaceous substance is wont to
occur, is on both surfaces of the serous membranes, or
infiltrating the cellular membrane where this texture is
abundant and loose.

I believe the term 'lardaceous substance' is occasionally

applied to products of a malignant character, and more especially to some which are nearly allied to fungoid disease; and which, whilst they want the firmness of true scirrhus, are nevertheless much firmer, and less vascular, than those tumors which receive the appellations of fungus hæmatodes and fungus medullaris. This application of the term 'lardaceous substance' I consider unfortunate, since it tends to a confusion of ideas. I mention it, to point out the propriety of avoiding it; and shall rather consider this form of white deposit under the next head, or that under which I shall have to notice whiteness as the result of malignant disease.

The term 'lardaceous substance' misapplied to malignant growths.

It is needless for me to repeat the description which I have already given of those adventitious structures: and I have only to remind you, that whilst, from various causes, they assume different colours, there are some which, from their whiteness, have received particular appellations, which require mention here. True scirrhus, when arrived at that stage in which death and softening are only about to commence, is generally of a whitish colour. The coagulated secretion filling the cysts which constitute the basis of a fungoid tumor, though often translucent or transparent, soon becomes opake; and in this stage, when it presents a nearly pure and dead white, if it have received few or not any vessels, and have not been discoloured by extravasated blood from the vessels of the containing membrane, it has received different designations, according to its degree of firmness. When its power of resistance is considerable, it has been called, as I have just remarked, 'lardaceous': at other times, it has been termed 'fibro-cartilaginous,' or nearly so. The pancreatic tumor of Abernethy is, I believe, a variety of this kind, differing from the former in consequence of the greater distinctness of the secondary and tertiary cysts, of which the mass is made up; and, in fact, approaching more nearly to the non-malignant tumors dependent on compound serous cysts, to which the term 'hydatid' has been erroneously applied. If the white fungoid

Whiteness of some malignant growths.

Pancreatic tumor.

Y

matter is softer than in the preceding forms, which is often the case when the enclosing membranes are of large size, or extremely thin and tender, it is called 'cerebriform,' or 'medullary,' from its resemblance to the white substance of the brain. When it is still softer than this, it becomes almost fluid, and nearly or quite loses the traces of its original structure, from the breaking down of the containing membranes: and in this form, I believe it to constitute the tumor which Dr. Munro has described as a specific form, **Milk-like tumor.** under the name of 'milk-like tumor.' When the structures surrounding the original adventitious growth become inflamed, they are apt to be infiltrated, as I have already remarked, with an effusion very similar to that of which the tumor is composed; and consequently appear to degenerate into a medullary, milk-like, or, as some will have it, lardaceous character.

Whiteness of hypertrophied glands. The absorbent glands are liable to a very remarkable increase of size, in consequence, as it appears, of a general hypertrophy, in which the superadded substance is frequently of a light or nearly white colour: it is quite distinct from malignant disease; and also differs from the scrofulous and tuberculous deposit, which is another of the white solid productions presently to be brought under your notice.

Mottled kidneys. The kidneys are subject to a very remarkable light-coloured, or white, diffused deposit, constituting a most important disease, which has been ably elucidated by Dr. Bright: this deposit is neither malignant, nor, strictly speaking, tuberculous.

Whiteness of tubercular deposits. The scrofulous deposit, or, as it is called, the tuberculous, when this term is used to indicate a particular substance rather than form, appears to constitute a secretion, and not an adventitious tissue; yet, as it has been placed by some pathologists among this latter class, I shall notice it in this place, before proceeding to speak of the white secretions to which it may form a suitable transition. It accompanies and characterizes so important a class of derangements—

I mean the scrofulous affections—that it appears to claim a more full consideration than can with propriety be given to it in a mere digression on the subject of colour. I must therefore, for the present, limit myself to observing, that though, in different situations, it appears to consist, in its first stage of production, of a slightly translucent deposit, it shortly acquires opacity; when it generally presents a light, and nearly white colour, which has occasionally a pale yellow or green tint. It occurs, collected into masses, varying in size from that of a millet-seed to that of a hen's egg, or larger: it also occurs in an irregularly diffused form, as we see in tuberculous infiltration of the lungs. In a crude state, it gives a white and lightish colour to the natural and pre-existing structure; but when it is collected in masses, it has generally pressed aside or occasioned the absorption of the structure in which it is deposited. When it affects the serous membranes, it appears, if abundant, to whiten them, by investing the surfaces which these membranes cover. Thus we find the pleura and peritoneum appearing as if they had been sprinkled with minute particles of broken-down boiled rice.

There are various white secretions, which I need do little more than enumerate. White secretions.

The most remarkable, as well as the most familiar instance of a white secretion, is that which, for a limited period after parturition, is produced by the female mammary glands. So familiar a fluid requires no description; and, in its natural state, rarely possesses any pathological importance. It may, however, make its appearance by a preternatural orifice, when the breast of a female, suckling, has been the subject of abscess, which has been opened. The escape of milk, in such cases, greatly retards the closure of the orifice: hence the importance of distinguishing this irregular discharge of milk from the purulent secretion resulting from the inflammation of the part. The whiteness of milk appears, on microscopic examination, to depend on Milk.

the suspension of an infinite number of globules of extremely small but very irregular size, and totally differing from the particles of blood with which they have been confounded. Sometimes the lactiferous tubes are distended so as to form tumors, in consequence of the accumulation of the solid parts of the milk. This inspissated secretion, like the milk itself, is of a white colour, and presents the appearance and, to a considerable degree, the chemical character of cream cheese.

White se-
cretions of
serous and
mucous
membranes.

The secretions from some of the serous membranes, under some forms of inflammation, are whitened by the suspension of myriads of minute flocculent particles of opake, coagulated, but non-plastic lymph; which has led to the mistaken notion of milk having been actually trans-ferred from the mamma to the cavities of these membranes. The secretions of some of the mucous membranes some-times lose their natural degree of transparency, and present an appearance bearing a close resemblance to thick milk, or paste. This perhaps is more particularly the case in the jejunum, and commencement of the ileum, than in any other situation. This character of the mucous secretion ought always to arrest the attention of those who are engaged in examining mucous canals for the purpose of investigating their diseases, since it may be regarded as a certain token that the membrane producing it has not been in a healthy state : but, though it is often a consequence of inflamma-tion, it is very questionable, whether it be always de-pendent on that state. Mucus, of the character of which I have been speaking, occurs in the part of the alimentary canal which I have mentioned, in conjunction with the presence of various intestinal worms. Though the presence of these animals may have proved a source of irritation to the mem-brane, and disturbance to its secretion, yet the proofs of decided inflammation are not always present.

White se-
cretion in
the Fallo-
pian tubes.

The secretion of the mucous membrane is seen of an opake white colour and viscid consistence in the Fallopian tubes, in

cases in which there can be little doubt that the membrane lining them has been acutely inflamed; since it is not only highly injected, but sensibly thickened, especially towards the morsus diaboli, where the fimbriæ become quite turgid. This white secretion is not however to be confounded with a white secretion of a different character, by which these tubes are sometimes prodigiously distended, and of which I shall presently have to speak. The mucous membrane of the uterus appears, at times, to be the source of a similar white and viscid secretion; and though it does not seem to be connected with a high degree of inflammation of that organ, yet it evidences a degree of irritation in it, which is possessed of more importance than is generally ascribed to it. The most valuable practical observations respecting it are unquestionably those which have been offered by my friend Dr. Addison, in his essay on uterine irritation.

What is the nature 'of the secretion from the mucous membrane of the bowels in that species of diarrhœa called lientery, and which, from its whiteness, has been supposed to be chyle, I am unable to say; but we have lately heard much of an abundant secretion from this membrane, more nearly resembling rice-water than milk, but which, nevertheless, has been imagined to consist, in part at least, of chyle. Without here attempting a refutation of such an opinion, which I believe to be wholly inadmissible, I may observe, that I believe it to be the result of an extensive and high degree of irritation, which, by greatly increasing the quantity as well as modifying the composition of the secreted fluid, prevents its elaboration into mucus. A somewhat analogous example is seen in ordinary catarrh, when the mucous membrane of the head is affected: the irritation, however, being much greater, a portion of coagulable lymph, as well as the more fluid principles, are exhaled, and, by their intermixture in the form of small particles, occasion the turbidity, not to say whiteness, of the secretion ·in question. The degree of this, as well as its

Rice-water evacuations.

chemical properties, must necessarily be liable to considerable variations.

White secretion from the pulmonary mucous membrane.

The mucous membrane of the air-passages, though it seldom affords a white sputum, is nevertheless liable to be loaded with a white viscid secretion, which variously modifies the appearance of the lungs, according to its situation. When·occupying the ramifications of the bronchi, it obstructs them, renders them turgid, and gives to a section of the lung an appearance of presenting numerous cells, filled with a light-coloured purulent secretion. If this secretion is not continued to the extremities of the tubes, so as to fill the cells, the substance of the lung is often pale and doughy: but if it do extend to the termination, the cells are filled with this secretion: the part of the lung affected is consequently distended, and presents a white colour, a greatly increased specific gravity, and a considerable degree of solidity: it, in fact, constitutes that form of white hepatization which I believe to be white from the commencement, and therefore to be distinguished from that form of light-coloured hepatization, or consolidation, to which I alluded in the earlier part of these remarks. The form of which I am at present speaking, is the best illustration and confirmation of the views of those pathologists who adopt the opinion, that the product of inflammation in pneumonia is chiefly situated in the cavities into which the air is admitted, rather than between them;—an idea to which Laennec, Rostan, and Andral, have in some degree inclined, but on which my friend Dr. Addison has particularly insisted.

White secretion allied to tubercle.

There is another instance of white secretion closely allied to that which I have mentioned, as occupying the cells and minute bronchial tubes of the lungs; which has been carefully pointed out by Dr. Carswell. It seems to be nearly or quite identical with tuberculous matter, on the production of which it throws some important light. Its most striking occurrence is in the Fallopian tubes; which in

young subjects are, not very rarely, plugged up, and dis-
tended, by this firm, nearly white, friable substance. Chronic
peritonitis appears to be the principal, if not the sole ex-
citing cause of the chronic inflammatory state of the lining
membrane of the Fallopian tube which produces this secre-
tion. I have known this material to distend the Fallopian
tube to the size of one's finger : and there seems to be
every reason to believe that this state of the tubes, which
must permanently interfere with their function, is one of
the causes of obstinate and even fatal amenorrhœa and
chlorosis. It is well known, that a large portion of those
children who are deaf and dumb are, for the most part, of a
strumous constitution; and it has been found, in some in-
stances—though I am inclined to think them rare—that the
cause of deafness has been a deposition in the Eustachian
tubes, similar to that which I have mentioned. In one
instance, it has been successfully removed by means of a
syringe; and a certain degree of hearing has been obtained.

It not very uncommonly happens, when an ureter has White se-
cretion in
the pelvis of
the kidney. been to a great degree obstructed, that the pelvis and infun-
dibula of the kidney are distended by a substance re-
sembling whiting and water, whilst the glandular part is
more or less extensively absorbed. The nature of this
pathological appearance is certainly somewhat allied to the
derangement of the Fallopian tubes already mentioned;
yet I think that the resemblance is not quite so great as my
friend Dr. Carswell is inclined to consider it, for I can
hardly regard this white secretion as tuberculous matter.
Though in part derived, like the contents of the obstructed
Fallopian tubes, from the secretion of the membrane which
contains it, I think there can be no doubt that it is in a
great degree derived from the urine in an unhealthy state,
and charged with ammoniacal and earthy salts.

LECTURE XII.

ON MALIGNANT DISEASE.

CIRRHOSIS.—DESCRIPTION OF THIS DISEASE BY BECLARD—DISTINCTION OF
CIRRHOSIS FROM NON-MALIGNANT STATES—PARTS IN WHICH CIRRHOSIS
HAS BEEN OBSERVED—IDENTITY OF CIRRHOSIS WITH FUNGOID DISEASE—
MELANOSIS — BLACK COLOUR IN MELANOSIS — OPINIONS OF DIFFERENT
AUTHORS CONCERNING MELANOSIS—TRUE MELANOSIS IS ALWAYS CYSTI-
FORM—DESCRIPTION AND PROGRESS OF MELANOSIS IN THE HORSE—VASCU-
LAR SYSTEM OF MELANOTIC GROWTHS—CHEMICAL ANALYSIS OF THE BLACK
MATTER OF MELANOSIS—MELANOTIC DIATHESIS—PROMINENT POINTS FOR
CONSIDERATION IN THIS DISEASE — NOTICE OF A FLESHY FORM OF MA-
LIGNANT TUMOR — HISTORICAL SKETCH OF THE OPINIONS BROACHED
CONCERNING THE ORIGIN OF MALIGNANT DISEASE — OPINIONS OF HIP-
POCRATES, AMBROSE PARÉ, PETIT, SOEMMERING, AND OTHERS, WHO HAVE
ADVOCATED A LYMPHATIC ORIGIN; CRAWFORD; B. BELL; POUTEAU, &c.
—OPINIONS HELD IN FRANCE.—DOCTRINES TAUGHT BY BROUSSAIS AND
THE DICTIONNAIRE DE MÉDICINE, AND STRICTURES ON THESE DOCTRINES—
STATEMENT AND EXAMINATION OF THE VIEWS OF LOBSTEIN—OPINIONS
OF DR. CARSWELL, AND COMMENTS THEREUPON — VIEWS OF THOSE WHO
ADVOCATE THE HYDATID CHARACTER OF MALIGNANT GROWTHS; AS, ADAMS,
BARON, AND CARMICHAEL.—STATEMENT OF THE VIEWS OF THE AUTHOR,
AND ARGUMENTS IN THEIR SUPPORT.

GENTLEMEN,

HAVING concluded the remarks which I have thought it
desirable to offer respecting colour in connection with the
animal tissues and secretions, and more especially in re-
ference to their pathological state, I now proceed to speak
of those forms of malignant disease which have obtained a
separate attention in consequence of their colour.

Cirrhosis.

I shall commence with cirrhosis; not because it is the most
important, but because, if the view which I take of this adven-
titious structure be correct, it bears the closest relation to
those which I have already described; so much so, in fact,
as scarcely to require separation from fungoid disease, of
which it seems to be a variety.

Cirrhosis is thus described in Beclard's General Ana-

tomy. "Cirrhosis, or the yellow morbid tissue, is sometimes found in masses, and sometimes in the form of layer or cyst. When in masses, this structure is yellow, compact, flaccid, moist, and bears some resemblance to the tissue of which the supra-renal capsules are composed. It has no distinct fibres. The masses vary in size, from that of a grain of millet, to that of a cherry-stone. They are sometimes almost innumerable. Those of the largest size appear to be lamellar. The tissue softens down into a grumous mass of a greenish brown colour. The effects which it produces, local as well as general, are by no means strongly marked. It often exists, in considerable abundance, in the liver; which is then diminished in volume, puckered and rough-ened. It is also occasionally seen in the kidney, the prostate, the epididymis, the ovary, and the thyroid."

This description I believe to have been taken from notes of Laennec's Lectures; and I must confess that I am at a loss to decide, with any certainty, as to the precise morbid structure which Laennec had in view. Andral, in speaking of the acini of the liver in a state of hypertrophy, says: " These little bodies, resembling grains of yellow wax, were regarded by Laennec as an accidental tissue, altogether ad-ventitious, like an hydatid. This tissue he called ' cirrho-sis,' on account of its colour." Now, though it must be ad-mitted that the description of this structure, which I have quoted from Beclard, seems to belong tolerably accurately to that state of the liver which is met with in cachectic sub-jects, but principally in those who have been injured by excess of mercury, and in which the acini may be picked out in defined particles of various sizes; yet I can scarcely believe it possible that so accurate an observer as Laennec could have been led to regard this appearance alone as sufficient ground for establishing a distinct variety of ma-lignant disease. From the much greater liability to this disease which is ascribed to the liver, it seems highly probable that more than one derangement of structure

coloured by the bile may have been confounded with the
yellow malignant disease now under consideration. Besides
the altered condition of the acini, such as is met with in per-
sons injured by the excessive use of mercury, I have seen a
diseased state of the liver which consisted in a derangement
of its original structure rather than in the production of an
adventitious tissue, and in which, though the whole organ
was altered, it was not uniformly so. Some parts presented
a compact close texture, which might be almost compared
to cheese. The liver in this case was remarkably yellow,
having almost a citron colour. This pathological appear-
ance might be by some regarded as cirrhosis. The coarsely
granular state of the liver so frequently induced by the use
of spirits may also be unusually coloured by diffused bile,
and be taken for cirrhosis. This, however, is liable to the
same objection as the before-mentioned cases.

True
cirrhosis.

Making every deduction of these and similar instances,
there will, I believe, still remain examples of accidental
tissues, which present partially a yellow colour, and are of
a malignant character : to these the name 'cirrhosis' should,
I conceive, be restricted. I have seen this in tumors deci-
dedly encysted, and exhibiting the mode of formation which
I have pointed out. I have seen it accompanying fungoid
tubercles in the liver; in which, nevertheless, it did not
appear to depend on the colouring matter of the bile, as it
occupied a position at or towards the centre of the tubercle,
where it appeared that the process of breaking down was
about to commence. I have seen it more than once in the
kidneys, in cases of prodigious enlargement of the organ
from fungoid disease. Here the yellow colour was fixed
in the oldest and most deeply-seated parts of the tumor.
I have seen it, under similar circumstances, in the supra-
renal capsules and in the ovary. I have observed the same
thing in a large and old fungoid tumor nearly filling the
pelvis, and growing from the ligamentous structure covering
part of the sacrum; and also in a numerous collection of

fungoid tumors continued along the course of the aorta, the greater number of which were of an unusually pure white. The tumors so partially coloured with yellow generally, if not invariably, present, in some parts, a dead white; which strikingly contrasts with the variable degree of translucence belonging to such adventitious tissues in their recently-formed and more vital state.

If you now call to mind the cases in which the yellow pigment is produced, apparently from the colouring matter of the blood, and independently of any tendency to malignant disease, you will probably agree with me in the opinion, that the yellow colour is merely an accidental character attached to a particular form of fungoid disease in a particular stage of its existence, and does not entitle the tumors in which it occurs to be regarded as instances of distinct malignant disease. It is nevertheless by no means void of interest, since it points out the date of different parts of the tumor. It seems also, in conjunction with the dead opake white which often accompanies it, to indicate a state of the tumor, which, with a good enclosure of condensed cellular membrane, might remain inert and stationary for an almost indefinite period, did not the growth and progress of other parts of the tumor produce a fatal effect on the system.

Cirrhosis is only a modification of fungoid disease.

Masses of fungoid growth, when they have thus acquired the yellow colour which I have described, in conjunction with the dead opake white, bear some resemblance to scrofulous or tuberculous matter in various stages: and I fully concur in the opinion which I have heard expressed by my friend C. A. Key, that it is in consequence of this appearance having been assumed by some portions of fungoid tumors, that they have been regarded as scrofulous: and it also accounts for the opinion held and taught by one or two eminent surgeons, that fungoid disease is allied to scrofula, and is apt to occur conjointly with it in the same parts; with which opinion I have not yet seen reason to unite.

Cirrhosis confounded with scrofula.

I now proceed to speak of that singular affection to which

Melanosis.

the term ' melanosis ' has been applied.   As this is a disease
of much greater rarity than the fungoid, there is less reason
for surprise that it has not, till lately, attracted the especial
attention of pathologists, or been regarded as a distinct
First ob-
servers of
melanosis.
disease.   Like the fungoid disease, it had this degree of
importance first attached to it by Laennec, who published an
account of it, illustrated by cases, in the *Dictionnaire des
Sciences Médicales*.   It has since been treated of by Burns,
Wardrop, Bresehet, Cullen, Carswell, Merat, Savenko, and,
more recently, in an elaborate thesis by Noack, a pupil at
one of the veterinary schools in Germany.

Incidental
notices of
melanosis
in early
writers.
Although this disease had not been treated of in a sepa-
rate form by any author before Laennec, conclusive evi-
dence of its having been seen, may be gleaned, in the form
of scattered remarks, amongst the writings of several of the
early pathologists.   Laennec himself has cited one example
from Haller.   Noack mentions several of those who have
spoken of it ; amongst whom are Morgagni, Bonetus, High-
more, and Lorry.

Melanosis
not con-
fined to
man.
Melanosis is by no means confined to man.   It is even
more common in horses than in him : and the German
author of whom I have been speaking, informs us, that it is
hinted at, as one of the affections of this animal, by Celsus,
and Vejetus Renatus.   According to Viborgins, it has been
more particularly treated of, under the name of ' Langins,'
by Laurentius Rusius.   It is also mentioned as occurring
in the dog and the rabbit ; and in some birds, as the ardea,
and the leueardia.

Melanosis
confounded
with other
appear-
ances.
There appears to be great confusion in the mode in
which the subject of melanosis has been treated.   The prin-
cipal source of this confusion seems to have been, that
whilst some have pretty strictly confined the term to a
disease marked by an adventitious heterologue deposit of a
black colour and of a malignant character, others have given
to the term a much more extended signification, and em-
ployed it in speaking of all cases accompanied by an irregular

and excessive production of black matter. The mere formation of this pigment, as I have already endeavoured to shew, is by no means necessarily connected with malignity. Unless in very large quantity, its presence in a particular tissue seems to be unaccompanied by any injurious general effects.

The pigment on which both the colour and the name of melanosis depend, is, with apparent accuracy, considered as the same with that which is common and natural to various parts, both in man and in other animals; and on which I made some remarks in my last Lecture. I suggested that this black matter depended on a highly venous state of the blood, induced by a prolonged stay in the veins: and Noack has expressed very nearly the same opinion. _{Black colour of melanosis.}

Laennec describes the collections of melanotic matter as resembling scrofulous tubercles, scirrhus, and fungoid matter, in this, that they exist in two states; the one of *crudity*, the other of *softening* or decay. In the state of crudity, he says that melanoses are of the firmness of lymphatic glands, of a deep black colour, and of an homogeneous texture, in which there is but little humidity;—that they are opake, and bear considerable resemblance to the absorbent glands of an adult. When this structure begins to soften, as is common to deposits of this class, a thin reddish fluid may be expressed from it, mixed with small black fragments; of which, some are tolerably firm, and others are friable. At a more advanced period of the softening process, these fragments, and, shortly after, the entire mass, become completely friable, and are presently converted into a black pultaceous substance. Laennec describes melanosis as existing under four forms: the first, in which the masses composed of the peculiar structure are enclosed in cysts: the second, in which the peculiar matter, although collected into masses, does not appear to be enclosed in cysts: the third, in which the black matter is diffused throughout the structure of the affected organ; and the fourth, in which the black matter is simply deposited on the surface of a part.

Merat divides melanosis into: 1. The tuberculous; 2. The membranaceous; and, 3. The liquid forms. Breschet divides it into the encysted and the non-encysted. Noack, whose descriptions are drawn from the appearances presented in the inferior animals as well as in man, divides melanosis into the *external* and the *internal;* and then employs the subdivisions of Merat, to which he adds the open or ulcerated form. Another form has been described by
Dr. Savenko of Petersburg, but it appears to be merely a complication of cancer, or fungus, with melanosis. I apprehend that some of these forms ought, for the reasons which I have already given, to be detached from the class of structures with which I am at present engaged.

The encyst-
ed is the
only form of
true mela-
nosis.
All the authors who have had an opportunity of becoming acquainted with the disease, agree in describing an encysted form, which I conceive strictly to belong to our present subject. Laennec describes the cysts observed in this form as of a regularly rounded figure; and varying in size, from that of a filbert to that of a walnut. They are of uniform but inconsiderable thickness, and bear a near resemblance to cellular membrane. Their internal surface is smooth, but adheres slightly to the matter contained. The bond of this union, in some cases, appears to be a fine cellular membrane; which I imagine may have been the result of accidental adhesions between the surfaces of the reflected membrane. Cullen and Carswell notice the formation of adventitious cellular membrane in which the pigment is deposited; and state, that it may be detached from the membrane beneath. Laennec says, that he has only found the encysted form in the substance of the lungs and liver; but this form has been observed in a great variety of situations by other authors.

In the horse, these cysts appear to be most frequently met with under the skin, especially about the anus and genitals; parts in which it will be observed that the existence of black matter is common, even when the animal is grey or nearly white. In these animals they are apt to form masses of

large size. Gohier mentions one which weighed thirty-six
pounds. Sometimes they are branching and pedunculated :
at other times they are attached by broader bases. They
present several varieties in colour : some are jet black ;
others only blackish or brown ; and some are mottled with
black and white. There is likewise a difference in the ex-
ternal surface of these cutaneous melanotic tubercles.
Sometimes they are smooth and polished ; sometimes they
are rough and warty ; at other times they are covered
with a separable horny crust, which is probably nothing
more than the dried exudation or discharge. Their com-
mon figure is round, ovoid, or reniform. They appear, in
general, to be attended with but little pain, except when in-
flammation is set up in the surrounding structure. Cracks Progress of
melanosis
in the horse.
and slight ulcerations are formed, and increased, by the
movements to which the parts about the tail are liable.
These spots pour out a black or dark-coloured secretion ;
which in some instances is mixed with pus formed by the
surrounding parts. Notwithstanding that Breschet has
asserted the contrary, this fluid is often highly offensive.
Sometimes the ulcerated part exhibits a tendency to rapid
cicatrization, which gives rise to the formation of an indu-
rated mass : the wound, however, speedily re-opens, and
again pours out an effusion of dark fluid. Occasionally, the
tubercles remain nearly stationary, in an open ulcerated
state, for a great length of time ; but are deepest and longest
during the summer season. At other times, the disease
spreads rapidly to the surrounding parts ; and, suppuration
and gangrene taking place, the animal falls into a state of
marasmus, and dies, or is destroyed on account of the
offensive odour which attends him.

Although, in horses, the parts around the anus and geni- Parts of the
horse most
liable to
melanosis.
tals are the most frequently affected with disease, it also
occurs about the mouth. It attacks those parts which are
well covered with hair, as well as those which are nearly
bald. It is said to be not unfrequent near the scapula, and,

in short, wherever the cellular membrane is loose. This remark respecting the vicinity of the scapula, which is made by Noack, has been repeated to me by English knackers; and I observed the fact in one melanotic horse which I have examined.

When the melanotic tubercles are situated in parts abounding in loose cellular membrane, they are always rounded; but when subjected to pressure, they are modified by this cause. By Laennec, Breschet, and many others, the envelops of the melanotic tubercles are regarded as cysts; but Noack, notwithstanding that he admits their pedunculated form, considers these as nothing more than condensed and modified cellular membrane. In this, I am persuaded that he is mistaken. In those cases in which masses of melanotic matter are stated to have been formed without any appearances of cyst, I suspect that the cysts must have been overlooked, from causes similar to those which I mentioned when speaking of the form of fungoid disease in which the presence of cysts is very indistinct.

Lesion of structures adjacent to melanotic structures.

The surrounding structures are stated to be often found unchanged in the neighbourhood of melanotic formations; but in other instances they are considerably contaminated by it. Sometimes the muscular and tendinous fibres appear to be cut off in the melanotic mass: at other times they are pushed aside by it. Flandrin and Noack agree in stating, that in both these cases neither the muscular nor tendinous structures are contaminated by the disease. The bones and neurilema are said to be blackened, but not to be otherwise affected.

Vascular system of melanotic formations.

The melanotic mass is said to be incapable of being injected. Noack says, that the vessels going towards the morbid growth terminate by open mouths on the interior of the cysts; and that the injection, whether thrown into the arteries or veins, which are very numerous in the cysts, becomes extravasated and dispersed through the black matter. He makes at the same time the following remark; which I

consider as affording some confirmation to the opinion which I have offered respecting the causes which operate in the production of the black matter. He says, that he has often observed that the veins predominate;—that he has found them distended, and spread over the tumor, in the form of a web. He has likewise observed these vessels filled by a black matter, similar to that composing the bulk of the tumor. Breschet has likewise observed the presence of black matter in the vessels of the cysts ; but, according to Noack, he has mistaken the veins for arteries. Noack considers the black matter as a secretion from the veins. His own expression is, " Venarum præsertim viâ excerni mihi videtur." It has been also remarked, that melanosis is promoted by old age ; in which the venous character of the blood predominates.

The black matter of melanosis has been repeatedly subjected to chemical analysis. Socquet states, that the colouring matter is insoluble in alcohol; and that it consists of carbon dissolved in some animal fluid, from which it cannot be separated by any known chemical process. Hurtrel d'Arboval gives as its constituents, phosphate of lime, a portion of iron, and a black matter insoluble in alcohol. Lassaigne, from the analysis of a specimen of melanosis taken from a horse, gives : 1. A coloured fibrous matter. 2. A blackish colouring matter, soluble in dilute sulphuric acid, and also in a solution of subcarbonate of soda, to which it gives a tinge of red. 3. A small quantity of albumen. 4. Muriate and subcarbonate of soda, phosphate of lime, and oxide of iron. According to Barruel and Breschet, it bears a great resemblance to the black pigment of the eye, as analyzed by Berzelius.

Chemical analysis of the black matter of melanosis.

In horses, the disease appears to be both a constitutional and an hereditary affection. It has been observed to affect the colts of a particular sire, generally shewing itself about the second or third year. White and grey horses are most liable to it ; whilst the roan and the sorrel appear

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to be exempt from it, unless descended from a white parent.
A similar remark may be made with respect to man; since
those individuals who are of the melancholic temperament
are said to be most liable to melanosis. This predisposi-
tion, then, appears to concur with the predominance of the
venous system, and affords some further confirmation of
the opinion which I have offered respecting the production
of black matter. The melanotic diathesis may, as I be-
lieve, be nevertheless acquired by disease in individuals of
every temperament; although, for the reasons which I have
just advanced, it must be more readily produced in some
than in others. The sudden suppression of menstruation
has been given amongst the exciting causes. Warm cli-
mates appear to be more favourable to the developement of
the disease than the colder. I believe that, in some cases, the
production of this disease is favoured by a state of the body
closely allied to scorbutus, if not identical with it : and I am
the more inclined to admit this supposition, which was first
suggested to me by the examination of preparations and
published cases, from the circumstance of its having still
more strongly suggested itself to my friend Bransby
Cooper, by a case which fell under his observation in
Edinburgh; in which the patient, who was affected with me-
lanosis of the eye, and some other parts of the body, pre-
sented a scorbutic state of constitution in so marked a
manner, that every slight external violence produced ecchy-
mosis, which in some instances proved the commencement
of melanotic tubercles.

I feel some difficulty in urging an opinion respecting
a disease of which I know so little, from personal inspection,
as I do of melanosis : but I think the concurrent testimony
of most authors, as well as the facts which I have been able
to observe for myself, shew that there are two points to
consider in melanotic formations. The most obvious, and
consequently that which has attracted the most attention, is
the production of the black pigment. This, however, is the

Two things
notable in
melanosis ;

least formidable part of the complaint; since, as we continu- 1. black matter; ally see in lungs loaded with black pulmonary matter, no very serious evils appear to result from its presence. The other circumstance is the production of a new growth, more 2. fungoid growth. or less distinctly possessing the anatomical characters which mark a whole class of adventitious deposits, amongst which I have placed true melanosis. It is this which appears to be connected with the fatal constitutional taint.

The important question here suggests itself—Is the malignant disease, in which these two characters are combined, properly regarded as a distinct species of disease? or is it rather the result of the accidental combination of true scirrhus or fungoid disease, with the tendency to the production of black matter which is known also to combine itself with ordinary inflammation? Some cases are so strongly marked by the production of similar melanotic tumors in various parts of the body, that convenience, if not strict pathological propriety, will warrant us in forming them into a group by themselves. Others, and perhaps the more numerous, at least in man, present a manifest combination of the encephaloid tumor with the black pigment.

Before I quit the description of the varieties of malig- Notice of a firm fleshy form of malignant disease. nant diseases, I must notice a form, which with more propriety would have been introduced into a former Lecture, seeing that its peculiarity depends rather on its structure than its colour. The variety to which I am referring may affect both internal and external parts. The best specimen which I have seen, grew from the neighbourhood of the scapula, where it seemed to be connected with tendinous structure. Other specimens were connected with the peritoneum. The most striking peculiarity of this form of adventitious structure, which I believe to be one of the many varieties of fungoid disease, consists in the peculiar obscurity of the encysted structure, which, nevertheless, essentially exists in it. The tumors, which are of various sizes, present a remarkably smooth and rounded surface;

and in some cases they are attached by a very small pe-
duncle.   The smoothness and rotundity of these tuber-
cles depend on the absence of that irregular distension
which takes place in most other tumors of this class, and
is occasioned by the unequal growth of the subordinate
encysted parts of the tumor, by which a kind of hernial pro-
tuberance is often produced. If we make a section through
one of the smooth rounded tumors of which I have been
speaking, the structure appears, in many instances, nearly
or quite uniform.   It often seems well supplied with blood,
and has a kind of parenchymatous structure, not very dissi-
milar to that of the kidneys or the spleen of a fowl ; and I
have not in this state seen them shew any disposition to
soften or ulcerate.   We might easily take up the idea, that
each individual tumor consists of a single cyst, the solid
contents of which are capable of becoming well organized
and permanent, did we not in some instances find unequi-
vocal traces of that structure to which I have so often
referred.   The traces of it are particularly obscure in the
first-formed tumors ; and they become increasingly evident
in those of later formation, which likewise exhibit other
changes in texture, by which they insensibly approach to the
more ordinary character of fungoid disease.   Sometimes
the compound character of the mass of the tumor is made
up of subordinate encysted portions ; as is rendered evident
by a difference in colour, one part being more injected
than another, and perhaps approaching to the melanotic
character.   Sometimes a little exploration with the handle
of a scalpel will enable us to detect parts in which ready se-
paration of the cysts may be made ; and we then find that a
smooth well-encysted portion is enclosed, not by a thin re-
flected membrane, but by the solid parenchymatous struc-
ture of the neighbouring part of the tumor, which seems to
stand to it in the relation of a reflected membrane.   I have
had but few opportunities of seeing tumors of this descrip-
tion ; but they appear to be of sufficient interest to merit

especial notice : they likewise serve to illustrate the great variety in which the encysted character may be met with.

I have now endeavoured to throw before you the anatomical peculiarities of a large class of adventitious productions : amongst which are found some of the most formidable maladies to which the human frame is incident. This, I trust, will be admitted as a sufficient apology for my having so long dwelt upon one subject. If some of the points, on which I have the most insisted, have not seemed to direct you to any practical conclusions, I would wish you, first, to recollect, that the consideration of the curative means does not fall within my province ; and, secondly, that an accurate knowledge of the nature of a disease is not to be rejected as useless, because it does not directly suggest an infallible mode of treatment. It may, at least, direct our exertions for the discovery or invention of more successful methods ; and in the mean time improve our diagnosis ; which, when correct, is at all times honourable ; and, though it may lead to the unerring prediction of a melancholy event, must nevertheless, in the retrospect, afford satisfaction to the friends of the patient.

Although I have described to you the anatomical peculiarities of malignant tumors, and other structures closely allied to them, with a degree of confidence founded on observations, multiplied until they have produced conviction in my own mind, it will be right that I should not let you go away with the idea that the doctrine which I have advanced on this subject is that which has been universally promulgated and received. I shall, therefore, before I conclude, bring into brief review the principal opinions which have been advanced on this subject.

Hippocrates having observed that women of a dejected and melancholy cast, and who labour under difficult menstruation, were frequently affected with cancer, thought that the cause of this malady was to be found in Atrabilis, or a corrupting leaven fermenting in the humours. Galen, *Theories of the nature of malignant disease:—*

Theory of Hippocrates ;

Celsus, Aretæus, and most of the ancients, adopted these
views of the Father of Medicine, and contented themselves
with developing his ideas.   Even Lieutaud considered that
a melancholic humour was a frequent cause of cancer in
women of from forty-five to fifty years of age.

of Ambrose
Paré ;

Ambrose Paré attributed cancer to a malignant eating
humour, whose action he compared to that of a crab.   Per-
haps the nature of the accompanying pain may have had
some share in giving rise to the name of cancer.   According
to some authors, it is rather on account of the phagedenic
ulcers by which we see the tissues destroyed, and as it were
successively devoured, that the name of cancer has been
given ; whilst others assert, that it is from an imagined re-
semblance between the afore-mentioned animal, and the en-
larged veins about a malignant tumor, that the appellation
has been bestowed.

of
La Peroné,
Petit, &c. ;

La Peroné, Petit, and Quesnay, have pretended, that in
cancer the lymph is thickened, and converted into a sanious
eating humour.   Pelletan has also considered cancer as re-
sulting from the thickening and concretion of lymph in the
affected part.   Since the discovery of the lymphatic vessels,
many diseases have been vaguely attributed to morbid
alterations in the lymph.   It is not very easy to determine
what was intended to be implied by this term.   We are
still too much in ignorance both of the lymphatic vessels
themselves, and of the properties of the fluids which they
contain, to warrant us in forming a pathological theory
founded upon them.   Perhaps, as the authors of the Dic-
tionnaire de Médicine have very candidly observed, we
should be more accurate, and at the same time more just to
our predecessors, if we allowed their remarks, with respect to
the lymphatics, to be considered as referring to the capil-

of Sœm-
mering and
Le Dran;

lary vessels in general.   Both Sœmmering and Le Dran
have advocated the lymphatic origin of cancer : the latter
believed that a morbid state of the lymph is capable of pro-
ducing cancer, independently of any local causes, such as

blows or falls; and independently of the constitutional causes, such as the suspension of menstruation. Vigaroux likewise refers to the lymph as the essential cause of cancer; but he contends for the necessity of some precursory cause, capable of interfering with the progressive motion of the lymph. Chopart and Desault also adopted the idea of a stagnation of the lymph, but thought that this was occasioned either by the irritation or the atony of the solid parts induced by external violence.

Crawford considered that the production of cancer was accompanied by the production of a gas analogous to sulphuretted hydrogen. He thought that this gas became united to ammonia; and he compares the formation of cancer to alterations dependent on putrefaction. He has observed, that the secretion from a cancerous ulcer is generally very fluid; that it is not always of the same nature; but that it varies according to the remedies employed internally and externally, and according to the aliments made use of by the patient. By many, this secretion has been supposed to be so irritating as to excite ulceration in parts to which it is applied. It does not however appear to possess any contagious properties; both Alibert and Biett having inoculated themselves with it, without the slightest effect of the kind. The former has likewise introduced it into the stomach of dogs; and Dupuytren gave them portions of cancerous tumors, with the like result.

Peyrelhe denied the existence of a primitive diathesis; but attributed the disease to humours spontaneously extravasated in glandular swellings, and converted by putrefaction into an acrid and corrosive ichor. Benjamin Bell scouts the idea of the presence of an acrid principle; and regards the external accidents as competent to produce the disease, and as adequate to cause the formation of a fluid as acrid as that of cancer. By way of proof, he adduces the example of ulcers which accidentally assume a bad character, and secrete an acrid fluid which cannot be admitted to have existed primitively in the blood.

of Pouteau.   According to Pouteau, an accidental violence done to
the tissues, producing a solution of their continuity, is the
primary cause of the disease. "A blow," says he, " received
on a delicate part, like the breast, occasions, besides acute
pain, the rupture of a greater or less number of small ves-
sels, which gives rise to the escape of the blood and other
fluids which they contain : hence the livid discoloration
which accompanies bruises.   The extravasated blood is dis-
solved, becomes acrid, and irritates the nervous fibres
about which it is effused ; and a tumor is produced, which
is at first small, but by time acquires increased size and
hardness."

In the order of time, I might next direct your attention
to the opinions of Adams and R. Carmichael; but I reserve
the consideration of them till I come to speak of the
closely-allied doctrines of Dr. Baron.

Opinions   In France, where pathological anatomy has been culti-
held in
France—   vated with a degree of ardour which has been surpassed by
none of her neighbours, the received doctrines with respect
to adventitious or accidental tissues, of which those now
under consideration are the most important, are divided
that malig-   into two classes. According to the first, these structures are
nant tumors
are entirely altogether new, and produced by a sort of epigenesis. The
new
growths—   distinguished names of Laennec and Beclard are numbered
amongst those of its advocates.   The opinions of John
Hunter and of Abernethy are in conformity to those of this
that they   class.   According to the second class, amongst the sup-
are degene-
rations of   porters of which I must mention Dupuytren and Cru-
natural
tissues.   veilhier, the accidental tissues are nothing more than the
result of the transformation of natural tissues.   In the
phraseology of this sect, the heterologue adventitious struc-
tures are styled ' degenerations.' The doctrines of Brous-
sais, which have with so much avidity been imbibed by
great numbers of the younger members of the medical pro-
fession in France, have contributed powerfully to increase
the number of adherents to the last-mentioned sect.   Irri-
tation, and its consequent inflammation, being the almost

exclusive and universal agents, according to the creed of the abettors of the *soi-disant* physiological doctrine, every morbid alteration of structure is by them attributed to these causes; whilst those differences, against which they cannot close their eyes, are explained, by referring them to the different proportions in which the elements of the blood, under different degrees of irritation, are effused into the tissues whose engorgement they effect. All inflammations and subacute inflammations, observes Broussais, are capable of producing cancer; and its progress is always in the ratio of the existing inflammation. External cancer, the product of the irritative degeneration of the tissues in which albumen and fat predominate, is always accompanied by inflammation. Cancer is not incurable, so long as it is only local. According to this author, the inflammation of the external cancer is repeated by sympathy in the principal viscera: cancer is only developed in them as a consequence of this inflammation. It may, however, not be set up; since the cancerous diathesis is not so general as it has been said to be.

Opinions of Broussais and his disciples.

The learned authors of the Dictionnaire de Médicine, in their article "Cancer"—to which I am indebted for a considerable portion of the materials of this historical sketch—appear to entertain opinions very similar to those which I have last quoted. The paragraph which I am going to cite, I believe to be from the pen of Breschet. "According to us," says the author in question—" and our opinion is founded on the examination and dissection of a great number of cancers in every tissue—the structure, function, and position of organs may indeed influence their relative or comparative liability to cancerous affections; but we may venture to affirm, that no tissue is exempt from this alteration, even as no tissue is exempt from inflammation. Every structure may become the seat of cancer, either primitively or secondarily. The distinction established, by some pathologists, of primitive organic alteration in some

Opinions of Breschet.

systems, and secondary in other systems of organs, is alto-
gether false with reference to cancer. We consider cancer
as always succeeding to an irritation, or inflammation; and
incapable of being developed, unless one of these two
states have preceded it. Suppose some irritating cause to
act with a moderate force on the more or less extended
surface of an organ — what follows? There will be an
increased activity of the vitality of the part : the blood
will arrive in larger quantities by its vessels : the net-work
of capillaries is distended : the exhalant vessels allow a
coagulable fluid to escape into the cells of the tissue. If
the engorgement is inconsiderable, and proper treatment be
employed, the afflux of the humour soon ceases, the local
congestion disappears, and the coagulable matter is taken
up by the absorbents. In the opposite case, in which the
engorgement goes on increasing, there is an increase of
nutrition in the surrounding parts ; and an exhalation, simi-
lar to that by which false membranes are formed, at the
point at which the irritation is the greatest. This first
degree, accompanied by a sub-inflammatory state, may be
either entirely dissipated, or only disappear imperfectly : in
which latter case, there remains a nucleus of induration. Of
this nature are the small tumors which we observe in
glands ; and particularly in the mammæ, after they have
received some slight external violence. The affection is
essentially local, and is unaccompanied by any sympathetic
effect. If the irritating cause be removed, the product of
effusion still remains; and on its absorption, or non-absorp-
tion, will depend either the termination of the affection, or
the persistance of a nucleus which hereafter may lead to
the most serious effects. If, in consequence of an increase
of nutrition in the affected part — or if, in consequence of
some external cause, which is the more frequent case—·
inflammation be set up in the part, it is in a condition unfa-
vourable for resolution, or the production of healthy pus.
The parts, in consequence, soon become disorganized.

When the affected structure is near the surface, ulcera-
tion soon takes place, and by degrees quickly destroys the
whole of the indurated portion ; but when the effusion has
been deeply seated, the passage to the state of disorganiza-
tion proceeds, and the *débris* of the indurated mass form a
deposit, having the characters of what is called cerebriform
matter. When blood happens to be effused and mixed with
the *débris*, or when fungous granulations arise from points
at which an albuminous fluid has been exhaled, and become
imperfectly organized by the production of small vessels,
such as are formed in false membranes and fungating
ulcers, the name of fungus hæmatodes is applied. In these
successive states we see all the peculiarities which mark
mere induration, scirrhus, and cancer, as well as all the
varieties of cancer ; such as, carcinoma, fungus hæmatodes,
and encephaloid tumors ; for these alterations and degene-
rations all proceed from a pre-existing inflammation. When
a too great activity of nutrition takes place at the affected
part, the tumor increases, either by the continued effusion
of the coagulable or plastic lymph of the English Authors,
or by the production of a fatty mass, sometimes yellow and
firm, sometimes white, and nearly fluid. When almost
fluid, it distends the cells of the adipose membrane, and
produces that sort of serous cysts which some surgeons
have taken for true hydatids. In our opinion, scirrhus is,
in its nature, identical with those indurations or callosities
which accompany wounds and fistulæ. It depends, as we
have said, upon a deposition of coagulable lymph, or a very
coagulable albuminous fluid in the cells of the tissues ; and
it may be developed in all of them."

Such are the outlines of the doctrines which are taught
on this subject by the Authors of the Dictionnaire de Mé-
dicine, and which are held by many of their countrymen.
I confess I can by no means agree with these authors, in re-
garding those accidental productions, to which the term
' malignant ' has been applied, as so completely similar to

the products arising from ordinary inflammation. We are continually seeing common inflammation leading to the production of a structure possessing all the varieties of induration offered by true scirrhus, but which persists for years without inducing any of the local or constitutional effects which characterize all the forms of cancer. It is manifest, that the authors of the article in question, as well as most persons who have investigated the anatomical characters of cancer, have not unfrequently observed a cystiform structure; but, in common with most of their predecessors and contemporaries, they have regarded this circumstance as an accidental complication, and not as an essential feature.

Doctrine taught by Lobstein,

Lobstein, the late indefatigable Professor of Pathology at Strasbourg, rejected the Brousseian idea of the inflammatory origin of cancer; regarding it as a new and adventitious structure, the result of a deviation from the normal process of nutrition; to which he applies the term 'heteroplastic:' and, as there are other productions which are also regarded as heteroplastic, he designates cancer, and the other members of the group of malignant diseases, by the distinction of 'cacoplastic.' He gives no new or precise view of the anatomical structure of the cacoplastic tissues; but he notices the opinion of Deshayes-Gendron respecting the structure of scirrhous tumors, and appears to adopt it.

Deshayes-Gendron.

Chemical analysis of scirrhus.

He has given the results of the careful chemical analysis of scirrhous tissue made by Hecht jun. They are as follows:

ANALYSIS OF A SPECIMEN OF SCIRRHOUS BREAST.

	grs.
Albumen	2
Gelatine	20
Fibrine	20
Fluid fatty matter	10
Water and loss	20
	72

ANALYSIS OF A SCIRRHOUS MASS FROM THE UTERUS.

Water	35
Fatty substance	10
Fibrine	10
Gelatine	15
	70

Lobstein remarks the absence of saline matters in the scirrhous mass. It is obvious, however, that salts common to animal fluids and solids are not necessarily excluded from scirrhous matter; since we have seen that the scirrhous structure may become ossified, or rather petrified, by the accumulation of earthy salts.

Lobstein further differs from the Parisian pathologists with respect to the intimate relation between scirrhus and the various forms of fungus; and he very properly insists on the more rapid production of fungus, and on the superior tendency to its production in young subjects. But the occurrence of those cases in which the firmness and hardness of scirrhus are met with conjointly with the presence, in other portions of the same mass, of the softness and other characters of fungus have not led him to acknowledge the degree of relationship which I think should be admitted as existing between them. He gives to such tumors the name of 'dissimilar tumors.'

Lobstein's opinions as to the connection between scirrhus and fungus.

The most remarkable point which I have noticed in the opinions of Lobstein respecting the class of structures which we are now considering, relates to the mode in which he supposes the softening to take place. He regards this process as the result of the efforts made by nature to effect the organization of the adventitious structure: and he appeals to the fact of the evident existence of blood-vessels, in cases in which softening and ulceration have already taken place, as proofs of the truth of this view. Whilst I regard this opinion as inconsistent with the appearances exhibited by these tumors in their different stages—and with the fact, that

Lobstein's opinion as to the softening of malignant tumors.

the impaired vitality which precedes softening and decay is as unfriendly to the production of vessels in these heterologous structures as it is in the false membranes produced by the inflammation of serous membranes—I believe that the appearance of vascularity to which Lobstein has referred, is the result of irritation which the softened or decaying part excites in the neighbouring parts which still retain their life and organization. Lobstein, whose good faith I believe to have been equal to the laborious industry which he displayed both in making original observations and in acquiring the opinions and observations of others, appears to have had his attention more particularly turned to the perception of the differences than of the similarities and affinities of phænomena; and his propensity to express these differences by specific terms has had a tendency to overcharge pathological nomenclature.

Opinions of Dr. Carswell. The production of malignant disease has more recently been attributed to an alteration in the nutrient fluid by an author whose views are entitled to respect and consideration, not more on account of the prominent position which he holds as Professor of Morbid Anatomy in the London University, than because of the singular assiduity and perseverance with which, for several years, he has devoted himself to the investigation and admirable delineation of the vast variety of subjects which the extensive field of Pathological Anatomy presents. One argument adduced by my friend Dr. Carswell, in support of the view which he takes, is drawn from the fact which I have already noticed, that a substance resembling that which enters into the composition of the malignant tumor itself may occasionally be found in the interior of vessels, but more particularly in the veins; though it is occasionally found in the lymphatic, and even in the arterial system. It is evident that the material so found is not in *transitu* to the spot at which the bulk of the tumor exists. Its consistence, not less than the office which the veins and absorbents perform in conveying fluid rather *from*

than *to* the part affected, strongly militates against such an idea. Is this appearance, then, to be regarded as a sufficient proof that there exists an essential and general change in the blood in the system, such as to give rise to the developement of malignant tumors in one or more parts of the body? I conceive not. Whilst I am far from contending that the blood and other fluids in the system retain their natural and healthy constitution when the malignant diathesis is fully formed, I think that this change, whatever it may be, does not occupy the position assigned to it by Dr. Carswell in the series of events which occur in the production of malignant disease. We may observe, in the first place, that a tumor, possessing unequivocally the character of scirrhus or fungus, may exist in one particular part of the body only; leaving the rest of the system, for a considerable length of time, to all appearance, uncontaminated. How is it that the peccant humour confines its mischief to one spot, and performs the part of good and healthy blood everywhere else throughout the body? We frequently find, when an operation is performed for the removal of a malignant tumor, that the processes of healing and cicatrization of the wounded part proceed as regularly and favourably as possible, although the system may have been already sinking under the effects of the local disease; and, notwithstanding, that when death carries off the patient, even a short time after the effects of the operation have been recovered from, the viscera themselves are found affected, in such a manner as to leave no room to doubt that they had participated in the disease long before the performance of the operation. How is this fact to be reconciled with the theory, that the disease commences and essentially depends upon the morbid condition of the blood? I have already mentioned the fact, that when inflammation is set up in and around a tumor of malignant character, the effusion which takes place in the natural structures around the adventitious growth is apt to approach in composition to

that of the tumor : this, however, is not so much an evidence
of the general deviation of the fluids from their healthy
state, as of the local deviation from the healthy process of
nutrition : the accompanying symptoms of inflammation
attest the reality of this local change. The existence of a
material in some respects resembling that of the tumor in
the interior of vessels is, I believe, nothing more than one
of the effects of this change. Its more frequent occurrence
in veins favours this idea, since they are more disposed to
inflammation than other vessels : and, as they allow of its
extension along their course from the original seat of the
affection, we need have no difficulty in accounting for the
existence of the morbidly-produced material through a con-
siderable extent of the vessel.

Review of
other opi-
nions of Dr.
Carswell.

There are other points in the views of Dr. Carswell re-
garding malignant disease, respecting which I feel myself
obliged to dissent from him. He considers that the altered
fluid exhibits itself in three different modes. First, as the
nutrient fluid of the affected part taking the place of that
which in the healthy state maintains its organization; which
substitution progressively brings about the degeneration of
the tissue by an alteration of its chemical rather than of its
anatomical character. He instances the production of ma-
lignant tubercles in the liver as illustrating this part of his
view. It would be foreign to my present purpose to enter
into the complicated anatomy, and consequently complicated
pathology, of the liver, which it would be necessary to have
before us for the full discussion of the subject; yet I may
remark, that I find in these cases distinct traces of the
cystiform character, which Dr. Carswell believes to be
absent in the malignant tubercles of this organ; and that,
although the acini appear at times to undergo degenera-
tion, the cellular membrane accompanying the branches of
vessels and ducts is the texture in which the formation of
malignant tubercles in the liver commences. The Doctor
considers, that, in carcinoma of the stomach, the muscular

and cellular tissues of the organ are converted, by the nutritive process of transformation, into a homogeneous mass; which is afterwards softened down, or assumes the mammary, medullary, or hæmatoid form of carcinoma.—The second mode the Doctor describes as occurring on the free surfaces of serous membranes, upon which the heterologous material is found effused, without the membranes appearing to have undergone any previous change whatever. The existence of such an effusion must be an extremely rare occurrence, since I do not remember to have ever met with it. The multitudes of tumors of various sizes and appearances, which he mentions as affecting the pleura and the peritoneum, ought, I conceive, to be considered as situated behind the serous membrane which they raise and distend. On the attached surface, something like an effused layer may be seen, but only in an advanced stage of disease, when the natural structures have become inflamed in the neighbourhood of the adventitious and encysted growth.—The Doctor's third form is that which I have already alluded to, in connection with his view of the altered character of the blood : I mean, its appearance in a separate form in the vascular system, and more especially in the veins and lymphatics. Its existence in these situations I believe to be the result of inflammation attacking the malignant adventitious growth, and the natural structures connected with it.

There is another point in the Doctor's opinions, connected with these diseases, to which I must refrain from assenting, although I have not examined any specimen expressly for the purpose of investigating the question. In speaking of those forms of malignant disease which admit of organization, the Doctor appears to consider that vessels are formed *de novo* in the adventitious structure; that these vessels become subsequently connected with the preexisting vessels of the neighbouring parts; and that there is, consequently, a proper and a collateral circulation in these

formations. I am sceptical as to the production of new
and independent vessels, except in the case of an embryo;
and I believe that in the organization of new parts, the ves-
sels are always prolongations of those which were pre-
existent. I have already treated of this question, in speaking
of the organization of false membranes upon the surface of
serous membranes.

With respect to an objection urged by the Doctor as to
the relation existing between the heterologue substance
and the cysts which I have described, a reply to it, or
rather an explanation of my ideas on this subject, will be
found in the speculation respecting the formation of both,
which I shall venture to offer before I close this Lecture.

Writers
who have
observed
the cysti-
form struc-
ture:—

I shall now proceed to take a glance at those authors
who have more particularly referred the production of the
tumors of which we are treating to the developement of
hydatids or cysts. Although amongst the writings of some
of the oldest morbid anatomists are to be found sufficient
evidence of their having noticed the presence of cysts in
conjunction with malignant tumors, I shall, on the present
occasion, pass them over; since they appear, like the authors
of the article in the Dictionnaire de Médicine, to have re-
garded the circumstance as accidental, and not as essential.

Hunter.

Dr. John Hunter, who practised in the West Indies,
is generally referred to as the first promulgator of this
doctrine: but, as far as I can judge of this author, from
the few extracts from his paper which I have had the
opportunity of seeing, he appears rather to have been
engaged with the description of the appearances and habits
of vesicular worms or true hydatids, than with the ad-
ventitious serous cysts, and the tumors dependent upon
them. Dr. Baron, after quoting from Dr. Hunter a good
and well-marked case of acephalocyst hydatids, makes the
following remark: " With the knowledge of all these facts,
it is somewhat surprising that the ingenious author did
not push them to their obvious conclusions, and expose

more decidedly to the mind of his readers that great field of pathological investigation of which we have attempted to give an outline."

Dr. Adams, who, like Dr. Baron, appears to have considered the cases related by Dr. Hunter as favourable to the idea of the hydatid origin of cancerous and other tumors, appears to have been the first to advance and develope this doctrine. He considered cancer to depend on a vesicular worm—the hydatis carcinomatosa. This hydatid he describes as composed of a cyst with its contained fluid. The cancerous fungi are the appendices of the animal. The granulations, for the formation of which the hydatid excites the neighbouring parts, are produced, according to Dr. Adams, to protect the living animal against the deleterious influence of the inflamed and suppurating parts surrounding it, or by neighbouring dead hydatids: hence, these fungous granulations are not present in the early stage of cancer, but are formed subsequently, investing the hydatid, and producing a tumor beneath the skin.

Dr. Adams advanced the opinion, that cancer depended on vesicular worms.

In order to account for the various appearances which are met with, he refers them to different species of hydatids—the 'lymphatica,' the 'cruenta,' and the 'carcinomatosa.' He believed that these hydatids enjoy but a short period of life, but are reproduced with great rapidity.

Dr. Baron, who is generally referred to, by British and foreign pathological teachers and writers, as the advocate of the hydatid origin of pulmonary tubercles, has extended this view to the class of cancerous affections also. In this fundamental principle he agrees with Dr. Adams, from whom he strongly dissents respecting some of the details. The views of Dr. Baron are partly founded on the observations of Dr. John Hunter upon hydatids evidently of the species acephalocystis; and partly on the authority of his illustrious friend, the late Dr. Jenner, whose opinions and experiments he has adopted. From cases which cannot be mistaken, and from his own works, it is evident that he has considered

Similar opinions are held by Dr. Baron.

his hydatids, in one of their stages at least, as possessed of
an individual life.   He elsewhere ascribes their formation
to the dilated extremities of absorbent vessels; and again
refers the morbid appearances met with in many diseases to
the loss of the hydatid character altogether, and to transfor-
mations which subsequently take place.

The parasitical origin of some of the structures which we
have been considering has long been held by a distin-
guished surgeon in Dublin, Carmichael.   He lately com-
municated his views on this subject to the Medical Section
of the British Association, at its Meeting at Bristol.   They
will probably, before long, be made public.   At present,
I am unacquainted with them.

Richard Carmichael, who published a paper on Cancer in
the Philosophical Transactions in 1809, also advocated the
idea that this adventitious structure is possessed of inde-
pendent life, and recommended carbonate of iron for the
purpose of destroying it.   Meckel and Lobstein represent
Cléri, Burns, and Himly, as having victoriously combated
the idea of the hydatid origin of cancer.   I am not aware of
the mode in which they have treated the subject; but I trust
that, in the preceding Lectures, I have put you sufficiently
on your guard against the sources of fallacy connected with
this hypothesis, to render it needless for me to have recourse
to their arguments to convince you that it is untenable.

Such are the opinions which have been commonly en-
tertained as to the origin and mode of formation of this
important class of structures.   I shall occupy the remainder
of the present Lecture, and close the subject, by submitting
to you the views which my own observations and reflections
have suggested.

The tendency to produce adventitious structures, pos-
sessing the type which I have described, is by no means
confined to man: it occurs not only in different classes of
the mammalia, but also in birds: whether it ever occur in
cold-blooded animals, I am unprepared to state.

The general tendency to produce the arrangement which forms the striking characteristic of this whole family of adventitious structures, and their relationship in this particular, however much they may vary in colour, texture, size, figure, and position, appear to indicate that there must be some general cause operating in their production. Whether we succeed in discovering it or not, we may regard it as an object worthy of investigation; since, as these structures exhibit formation and nutrition in their simplest mode, they offer us the most favourable opportunities for commencing the investigation of those operations.

There is one practical advantage which may be derived from the consideration of the malignant heterologue formations in connection with the structural characters which I have pointed out, which I will take the liberty of suggesting. It will, I think, be readily admitted, that in reading the works even of the best surgical authors who have given us the history of cases in which these diseases have been concerned, it is extremely difficult to determine the precise character of the tumors which they had in view. This is a difficulty which greatly deteriorates the value of their cases, by precluding the possibility of drawing inferences as to the comparative frequency—tendency to increase locally or by the contamination of the system—chances of success from operation—and other important points which might be hoped for from the assemblage of such cases. Now I cannot but flatter myself, that a careful attention to the structure of these tumors, on the principles which I have pointed out, would lead to such an analysis, and appreciation of the appearances presented to view, that both description and recognition would be greatly facilitated.

There was certainly some plausibility in the opinions of the older pathologists, in referring to the lymph or nutrient fluid, the very striking deviation from natural tissues, not only as to form, but as to substance or material also. *On the origin of adventitious growths.*

I have no facts to warrant an opinion, whether the devia-

tion from the healthy state exists previously in the nutrient
fluid, or in the vessels which contain it. The functions of
both, in their inseparable relations, appear to be disturbed.
The following, as I am induced to believe, from the effects
which are within our observation, appears to be the kind
of operation which takes place. I advance it, not without
diffidence, and merely as a conjecture or hypothesis, which,
whilst it seems to possess the conditions required, will
serve to render more intelligible the views which I have
detailed.

It is admitted, on all hands, that a local injury is a very
frequent exciting cause of the production of the adventi-
tious growths in question. Hence arises the idea entertained
by some, that a little blood extravasated into the cells of
the cellular membrane becomes the first rudiment of the
They do not new structure. The correctness of this I am disposed to
originate in dispute; because we find a similar kind of material, and a
extravasa-
ted blood. similar reference to the same type of formation, in the dif-
ferent parts of the same tumor. Now, as to the formation
of the parts of the tumor superadded to the nucleus, or that
first formed, we are certain that it is not occasioned by ex-
travasation of blood, though such an occurrence may take
place as a mere complication. We ought therefore, I con-
ceive, to look to some other cause for the production of the
first portion.

Hints I conceive that the formation of a healthy granulation,
drawn from such as nature employs in the reparation of an ordinary
the granu-
lations of a wound or ulcer, may afford us some clue which may lead to
common the solution of the present inquiry. These granulations,
ulcer. when luxuriant, and exhibiting themselves on a large scale,
present a nearly smooth and rounded figure, yielding a fluid
secretion externally; but internally containing a more solid
material, plastic, and destined to become a tissue. In the
process of granulation, as it is conducted in the healthy
state, the size of these bodies or granulations is restrained
within certain, and, for the most, within narrow limits.

When, from some accidental cause, they exceed the ordinary volume, they sometimes present a very striking resemblance to a fungoid tubercle or granulation. At the same time, the smooth, continuous, defined, external surface calls to mind an observation which the production of false membranes upon the serous membranes, and in their cavity, has already given us the opportunity of making; namely, that it is the external part of the effused lymph, as well as of other coagulating fluids, which first becomes concrete, and forms a continuous membrane, shutting up the internal parts, whether they remain fluid, become organized, or break down. I had been forcibly struck with the resemblance which granulations, healthy in every respect except in their excessive exuberance, bear to fungoid productions; when an accidental circumstance arrested my attention, and appeared to throw some light on productions presenting the type of compound adventitious serous cysts. It happened that a fluid, perfectly transparent, and having a small quantity of mucus diffused through it, dropped into some spirit, of sufficient strength to precipitate or coagulate the mucus, and prevent its immediate admixture or diffusion through the spirit. As the drop descended towards the bottom of the vessel, its parts tended to spread and separate from each other; and as the mucus became opake in its coagulation, the falling drop was distinctly visible in a branching form, bearing the closest resemblance to the ramifying bunches of pedunculated cysts so frequently found in the cysts constituting ovarian dropsy. The resemblance was too striking to be overlooked, and the rationale of the figure of the falling drop was sufficiently obvious: each of the several portions into which the drop was divided, after it entered the spirits, met of course with some resistance as it descended through the spirit: its slight degree of coagulation would favour this effect, and would produce the rounded dilated extremities of the branch, by which, in consequence of the same coagulability, it continued connected

Analogy drawn from the diffusion of mucus in spirit.

with the other portions into which the original drop was divided. A similar appearance may be noticed, whenever two fluids are brought together, in such a way, that the one enters the other at a small point; whence it diffuses itself, retaining for a while its visibility, and the continuity of its particles, notwithstanding its diffusion. Thus we may see the appearance which I have described, on our plates at table, when, having added a little cream to fruit-tart, it makes its way, through the narrow straits which may allow it to pass between two pieces of fruit, into the transparent juice below.

In these two rough and accidental experiments, although the form produced is very striking, it is extremely evanescent, and is scarcely a moment in existence: but if the exterior of the fluid, which assumes the branching form, became a continuous coherent coagulum, as in the case of effused plastic lymph, a permanent bunch of cysts would have been formed. Let me not be misunderstood, as wishing it to be inferred, from what I have just said, that the bunches of cysts, entering into the composition of adventitious structures of animals, are thus instantaneously formed by the coagulation of the exterior of a quantity of coagulable lymph suddenly oozing through a small orifice. The process, though very similar, is doubtless gradual: the principle I believe to be nearly or quite the same. In a case of gummy or gelatinous cancer, which I have already described to you, some of the cysts, enclosing transparent ropy mucus, contained within this mucus another portion slightly opake, of but little more consistence, and presenting the form of a bunch of radiating pyriform bodies. From the nature of the materials here concerned, the appearance in question was but little more permanent than in the rough experiments which I have mentioned; but the case is very different with the ordinary compound serous cysts, as they are met with in ovarian dropsy, and in those tumors which affect a similar type. The form being once given, though

it be on a small microscopic scale, it will be more or less
preserved when the nutrition of the new growth has given
it a much larger size : this is not a gratuitous supposition,
to anticipate an objection, or explain away a difficulty.   In
the first formation, if it take place as I have supposed, it is
in strict conformity with what we may observe to take
place in many other situations ; and the coagulation of the
external part, and its consequent formation into a mem-
brane, may be safely admitted as an established principle.
The formation of the membranes of the ovum in all proba-   Illustration
bility depends upon it ; and it is to these membranes that I   taken from
the mem-
shall now refer, in order to illustrate, not merely the possi-   branes of
bility, but the probability, that when the type or form has   the ovum.
once been given, it may still be preserved when nutrition
has greatly expanded its dimensions.

I believe, that in admitting the probability of this mode   Arguments
of formation in the adventitious growths in question, I am   in support
of this view.
not led merely by the plausibility of an imagined superficial
resemblance. There are different circumstances, connected
with these growths themselves, which give support to this
belief.   I have already observed, that when there are nu-
merous growths of this kind upon a membrane, it is very
evident that they are principally disposed along the course
of the vessels : this is particularly striking with respect to
the smaller vessels. It may however, at times, be seen, that
the same tendency accompanies the larger vessels : and
I was forcibly struck with it, in a case in which a growth of
malignant character accompanied and nearly encased the
aorta in the abdomen, and extended to some of the neigh-
bouring trunks. In this case, which excited me to particularly
minute examination, although the little bunches of pyriform
bodies consisted of a light-coloured translucent substance
with very little variation in colour, it was evident that these
bodies radiated from different centres at or near the surface
of the aorta or other vessels.   The close proximity of a
new growth to an arterial trunk, and its apparent intimate

dependence upon this trunk, excited my surprise; since it
seemed to indicate that it had directly been concerned in
nutrition—a function which we are wont to consider, in most
instances, as only indirectly connected with the trunks
through the intervention of their branches, and more espe-
cially their minutest capillaries. It seemed, in the instance
which I am now considering, that the nutrient fluid, from
which the adventitious growth was derived, had actually
escaped by oozing from the aorta itself; yet it is perhaps
more likely that the vasa vasorum, and not the interior of
the principal vessel itself, had permitted such oozing to
take place. You will doubtless perceive that this view of
the commencement of the adventitious structure excludes
the question as to the priority of the cyst or its contents,
as the formation of both is almost simultaneous, and their
progressive increase proceeds *pari passu.*

It seems to me to be quite consistent with the mode of
formation which I here suppose, that the parts most dis-
posed to furnish this formation are such as have had their
texture injured; and, in conjunction with this, the mysteri-
ous power, which regulates formation and nutrition, either
impaired, as in parts which have received local violence, or
in which, through the influence of some natural causes, the
function of nutrition is subjected to considerable variation,
as the mamma and the ovary; or which, like nævi, always
possess it in an inferior degree. I am the more disposed
to admit the view which I have taken, from my not finding
that it is contradicted by any fact or demonstrated prin-
ciple: on the contrary, it seems mainly to depend on a
principle established without any reference to it, and which
admits of very extensive application; namely, the coagula-
tion and consequent formation of a pellicle or membrane at
the exterior or circumference of fluids susceptible of co-
agulation. The term 'oozing,' which I have employed in
speaking of the escape of the nutrient fluid from the vessel,
is, I admit, more questionable, and, in appearance, more

opposed to common opinions and the ordinary modes of
speaking. Though I make use of it rather conjecturally, I
wish to employ some term to make a marked distinction
between that aggregate deposition of nutrient matter which
leads to a new and adventitious growth, and the impercep-
tible, molecular, interstitial employment of the nutrient
fluids in the universal and constant healthy function which
is continually sustaining and renewing our tissues, and
counteracting the losses which the wear and tear of life
occasion.

Now, although it is pretty certain that some kind of
transudation, such as has been described as endosmosis and
exosmosis, takes place during life, yet it seems to be
different from the transudation which takes place after
death, and much less marked. It is to this transudation
that the escape of small portions of nutrient fluid for the
production of adventitious growths is somewhat allied. The
circumstance, that local injury or spontaneous decline of
vital energy in many instances may be proved to precede
such formations, give further plausibility to the idea of this
transudation or oozing. You will recollect, that I have
already expressed some opinions connected with this sub-
ject, when treating of parts predisposed to favour the growth
of adventitious tissues, which seemed to be the farthest
removed from that influence, which, whatever be its nature,
is sufficiently evident in its office of presiding over and
maintaining our forms. It is possible that the co-opera-
tion of the nervous extremities may be defective, and that
we see, in these growths, nutrition in one of its simplest
forms, and dependent solely on what may be termed plasti-
city of the fluids. The production of these growths appears
to be essentially distinct from inflammation, and ought not
to be confounded with it: but where inflammation has sub-
sided, and, its product being of the plastic character, orga-
nization is attempted, there is a certain similarity in the
elongation of old vessels into the new material. There is

likewise a similarity in the two cases, as respects the success
and permanency of this process depending on the nature of
the substance into which the vessels are to be elongated. I
see no reason to adopt the opinion of some pathologists, that
they are arterial and venous vessels in the one instance, and
arterial only in the other. Viewing, as I do, the adventitious
structures, with which I have now so long occupied your
attention, as examples of formation in its simplest character,
I think that they are well worthy of attention, indepen-
dently of their great importance with reference to disease:
I therefore recommend them to your careful examination,
whenever they may fall under your observation in a recent
state.

APPENDIX.

NOTES AND CASES.

LECTURE I.

ALTHOUGH it is not my object to give the bibliography of Morbid Anatomy, I must not omit adding to the List of Works mentioned at page 22, that of Dr. Cragie, on General and Pathological Anatomy; and that of Otto, translated by J. F. South. The former contains a vast assemblage of laboriously-collected facts, which must render it a valuable treasure to those already acquainted with the subject. An extensive Index, or an improved arrangement, would, however, render a new edition more convenient, and more extensively useful. The work of Otto, though concise, and not yet completed, is also invaluable for reference. It is a rich repository of facts and authorities; and possesses the great and almost singular advantage of combining, with Human, much of Comparative Pathology. I cannot forego this opportunity of recommending British Students to pay increased attention to this branch; as the derangements of structures and organs in inferior animals are calculated to throw important light on those of man. The pathological parts of the writings of J. F. Meckel are of great value. As respects arrangement, I have derived greater assistance from that author than from any one else.

LECT. II.

IT does not appear to be necessary to append either Notes or Cases to the general observations on the Serous Membranes; since particular facts may, with more propriety, be connected with the consideration of these membranes individually.

LECT. III.

Page 69.   See, in illustration of the Case of Arachnitis in which the pro-
duct of inflammation was on the polished surface, the 9th Plate in the
Second Volume of the Second Part of Dr. Bright's Reports of Medical
Cases, and the Manuscript Record of the Inspection at the Museum.

Page 72.   Adhesions between the two surfaces of the arachnoid, accom-
panying fungoid tumors.—See Preparations in the Museum ; and Dr.
Bright's Reports of Medical Cases, Part II. Vol. II. Plate 26 : also the
following Case, to which that plate refers.

ELIZABETH SMITH became a patient of Dr. Cholmeley, 9th of 12th month
(December), 1828.   She was night-nurse in Charity Ward, and was the
mother of one or more grown-up children.   For two years she had been
subject to considerable pain of head, especially across the forehead.   She
had likewise been subject, during the same period, to fits, resembling
epilepsy ; in one of which, which occurred a very few days before her death,
she fell on the fire, but was not burnt.   From this fit, until her death, she
had repeated fits of tremor and loss of speech, but continued sensible.   The
body was inspected 15th of 12th month (December).

HEAD.—On the anterior part of the right hemisphere, the two surfaces
of the arachnoid were closely and firmly adherent to each other.   There
were at this part several small fungoid granulations, which appeared to have
their seat immediately beneath the arachnoid, lining the dura mater ; and
might, for the most part, be separated from the surface of the brain without
injuring it (pp. 72, 84) : some, however, had contracted adhesions to it.
These tumors were scarcely so large as peas ; and were of a light colour, like
the glandulæ Pacchioni, with a dash of pink.   Over the rest of the brain
the membranes appeared tolerably healthy.   Some of the convolutions of the
brain were rather flattened.   There was rather a large quantity of serum
under the arachnoid, and infiltrating the pia mater ; and some very clear
serum in the ventricles.   The substance of the brain was generally loaded
with dark blood ; the medullary part presenting numerous venous points,
and the cineritious part being generally of a livid colour : this was most
remarkable in the cineritious portion of the corpora striata, but especially
of the right : in these, the lividity was more intense and deeper in some
parts than in others, producing a mottled appearance.   The substance of
the brain was generally flabby ; but under the fungoid tumors, and more
particularly those which had become adherent to the brain, the medullary

structure was extremely soft, appearing infiltrated with serum : it was un-accompanied by alteration of colour. The serum and medullary matter were not intermixed, so as to produce a cream-like substance. There were a few vesicles on the plexus choroides, which was of a purple colour.

CHEST.—The lungs and pleuræ offered nothing remarkable. The re-flected pericardium was remarkably thin. The heart was healthy, but pre-sented a white spot on both the anterior and posterior surfaces.

ABDOMEN.—The omentum was large, and attached by a strong old adhe-sion to the first part of the colon. In the pelvis there were two small, loose, rounded bodies, of about the size of peas : they had a light, smooth, semi-cartilaginous surface; but appeared to have a different structure, and a yellowish colour, internally (p. 160). The mucous membrane of the stomach was corrugated, and rather vascular, with a shade of grey : that of the intestines healthy. The liver was rather small; and had on its surface, immediately beneath its peritoneal coat, two small white tubercles of about the size of vetch-seeds : they were firm, and contained a small, smooth, easily detached nucleus, which in one was bony. The spleen was of moderate size, and accompanied by a small accessory one. Neither the kidneys nor the uterine apparatus offered any thing requiring notice.

Page 73. Puriform effusion beneath the arachnoid covering the pia mater. —See Dr. Bright's Reports of Medical Cases, Part II. Vol. II. Plate 1. fig. 1. Pl. 9. and Plate 10. fig. 1.

Leek-green colour of the puriform effusion.—See 8th Livraison of Cru-veilhier, Plate 4. fig. 1.

The two following Cases will serve to illustrate the progress and appear-ances of the non-plastic or puriform inflammation of the arachnoid and pia mater. In both, the comparatively slight derangement of the intellectual faculties is remarkable. In both there was a slight appearance of the pro-duct of inflammation on the polished surface of the arachnoid lining the dura mater.

25th of 12th month (December), 1832. H—— S——, aged 45, was of a feeble constitution, but of an active and energetic mind. From acci-dental causes, she had, for a period of a few weeks preceding her death, been subject to insomnolence. There had likewise been suspension and irregu-larity in the menstrual function. Eight days before her death, after having supped in apparent health, she was observed, during the night, or very early in the morning, and whilst yet asleep, to look so extremely ill, as imme-diately to raise the most serious apprehensions. She presently awoke, feeling

ill, with symptoms of a smart attack of fever. Medical assistance was imme-
diately called, and an active aperient given. The tongue was of a bright red,
with a tendency to be furred. The attack was obviously severe, with a
pulse shewing very little power to meet it. During the first few days, a
slight apparent improvement took place—the bowels acted with very little
assistance. Some pain on the right hypochondrium was relieved by leeches.
The temperature was but little elevated. With the exception of a little
transient rambling at night, the intellectual faculties were undisturbed.
About the fourth day, the head was shaved, and wetted with a cool lotion,
to relieve heat and occasional pain. The symptoms became progressively
worse, but were most distressing at night. The eyes were rather pale than
otherwise. The head, though uneasy, was not very painful. The senses
and intellectual faculties were clear until coma rather suddenly came on,
about twenty-seven hours before her death.

HEAD.—The scalp exhibited a rather remarkable appearance, the hair
over a considerable but well-defined portion being perfectly white: a spot
of this kind had existed for years, but had considerably increased. The
pericranium was rather dry: the dura mater was adherent to the inner
table of the calvarium. There was a thin and pretty transparent lymph,
interspersed with a few minute sanguineous spots, between the arachnoid
lining the dura mater and that covering the pia mater, but more particu-
larly attached to the former. The pia mater was almost universally in-
filtrated with a light yellow, concrete, puriform effusion, overlaying the
upper and under surfaces of the brain ; and extending, within the arachnoid,
as far as could be traced, into the spinal canal. The pia mater was by no
means unusually vascular ; indeed it was rather in the opposite state.
Although the large veins were turgid, the convolutions of the brain were
very much compressed and flattened. Not even the cortical part of the sub-
stance of the brain exhibited any increased vascularity or alteration of
colour. The ventricles were distended by a considerable quantity (about
two ounces) of serum, slightly turbid, and containing a few floating par-
ticles. It might be compared to water in which a small quantity of
bread-crumbs had been washed. The plexus choroides was very pale ; the
membrane lining the ventricles was slightly thickened, but rather soft ;
and some part of the substance of the brain, at the posterior part near to
the ventricles, was a little softer than is natural.

CHEST.—At the inferior and lateral part of the right pleura, there were
some pretty thick flakes of recently-effused lymph ; and the corresponding
portion of lung appeared to be inflamed. The left pleura and lung, and
the heart, presented nothing remarkable.

ABDOMEN. — The peritoneum presented no appearance of inflammation; but there was a small filament of recently coagulated blood, which, together with the appearance of catamenial discharge, and, on one occasion, bleeding from the nose, which occurred during the last illness, and the minute points in the lymph on the arachnoid, may be considered as indicating something peculiar in the state of the blood or sanguiferous vessels generally. It may also be remarked, that all the tissues appeared to be rather soft than otherwise. There were old and pretty firm adhesions between the convex surface of the liver and the parietes. The substance of the liver appeared healthy. The spleen was rather soft. The pancreas and kidneys were healthy. The alimentary canal offered nothing remarkable. The uterus was rather large.

9th month (September), 1836.   J—— H——, aged about 50, stout, of sedentary occupation, and habitually of dull hearing. A few weeks before his death, he became increasingly deaf, his throat rather sore, and his fauces swollen and livid. The circulation seemed rather oppressed than excited, and the bowels were torpid : aperients were given, and leeches and a blister applied to the neck. Some relief was obtained ; but the local means occasioned an unhealthy erysipelatous inflammation, which subsided. A few days before his death, he was suddenly seized with great tenderness, pain, and redness of one foot, especially about the great toe. This attack was attended with considerable fever, and had every appearance of gout, to which malady he had however never been subject. The affection of the foot being somewhat mitigated, was succeeded by more distressing pain in the hip of the same side. It was with difficulty endured, and caused much irritability. The febrile symptoms increased, but there was no incoherence of ideas, except a little at night, until about forty hours before death. In the morning of the day preceding that on which the patient died, he was decidedly delirious, and very imperfectly replied to questions put to him. The head was unusually hot. A very slight failure of muscular power was noticed on the same side on which the foot and hip had been inflamed. This diminution of power progressively increased to complete paralysis. The delirium in the mean time passed into permanent coma.

HEAD.—The dura mater adhered rather strongly to the calvarium. An extremely small quantity of a rather sanguinolent coagulated lymph was extensively diffused over the arachnoid lining the dura mater. The brain appeared as if covered with a close yellowish cap, in consequence of the thick and universal deposit of concrete puriform lymph beneath the arachnoid, and infiltrating the pia mater. These membranes, with the deposit just

BB 2

mentioned, formed a firm layer, in some parts nearly as much as one-eighth of an inch in thickness, which dipped in between the convolutions, but was very readily separated from the surface of the brain. The thickness of the puriform lymph was the more considerable on the side opposite to that on which the paralysis had existed. There was much less appearance of in-flammation on the inferior surface of the brain than beneath the calvaria. There was rather an increased quantity of clear serum in the ventricles. The external layer of the cortical substance was not particularly separable; and the substance of the brain, generally, though carefully examined, exhibited no conspicuous deviation from the healthy state. The only circumstance to account for the paralysis was the thicker layer of concrete puriform lymph already noticed as existing on one side.

The other parts were not examined.

Page 77. Bony deposit on the attached surface of the arachnoid covering the pia mater.—See Preparation 1585.

Bony deposit on the attached surface of the arachnoid lining the dura mater.—See several Preparations; and Dr. Bright's Reports of Medical Cases, Part II. Vol. II. Plate 31. fig. 2.

Page 80. Osseous bodies on the plexus choroides.—See Preparation.

Page 83. Blood effused beneath the arachnoid lining the dura mater.— See Preparations; Dr. Bright's Reports of Medical Cases, Part II. Vol. II. Plate 5; and Dr. Carswell's Fasc. VI. Plate 7. fig. 7.

Page 84. Fungoid tumors beneath the arachnoid lining the dura mater.— See many Preparations in the Museum; and Cruveilhier's 8th Liv. Plate I. fig. 1. Plate II. and Plate III.

Page 86. Puriform effusion within the spinal arachnoid.—See Cruveil-hier's 6th Liv. Plate III. figs. 1 and 2. drawn from cases occurring in infants.

Page 87. Adhesions of the spinal arachnoid.—See Preparations in the Museum; and Dr. Bright's Reports of Medical Cases, Part II. Vol. II. Plate 21. fig. 6.

The following Case will illustrate the effects and appearances of chronic arachnitis.

A. B. a private patient of Dr. Stroud; inspected 12th month (December), 1830. He was about 42 years of age; of moderate stature; by occupation, a clerk in the Ordnance Department. He had suffered for nearly two years

from paralysis, often not complete. His arms were more affected than his legs. He had no precursory apoplectic symptom : his intellect was not affected, but he often complained of pain of back, more particularly between the shoulders. No cause could be assigned.

HEAD AND SPINAL CORD.—On raising the scalp, the occipital bone was seen to project, as if it had started from the lambdoidal suture; the inner table of this bone corresponding with the outer of the parietal. There was nothing remarkable on the exterior of the dura mater. The polished surface of the arachnoid was particularly free from moisture : there was no unusual quantity of serum beneath it, infiltrating the pia mater. The substance of the brain was healthy. The lateral ventricles were very large, and contained about $\mathrecal{5}$iij of clear serum. The membrane lining them did not appear thickened, or materially altered. The foramen of Monro, without laceration or distension, was nearly a quarter of an inch in diameter. The plexus choroides, on both sides, was studded with numerous vascular cysts, some of which were about as large as currants. The septum lucidum was extremely thin : the commissura mollis appeared to have been separated. On raising the brain from the base of the skull, the arachnoid, covering the tractus opticus, pons Varolii, and medulla oblongata, and for some distance on each side of these parts, was found remarkably thick and opake ; to a great degree concealing these parts, and the nerves arising from them ; and giving to the whole an unusual smoothness, firmness, and density. The same condition extended into the spinal canal, as far as it could be seen from the cranium. The cord, when exposed through its whole length by the removal of the spinous processes of the vertebræ, presented nothing morbid to the eye, but appeared large and plump. To the finger, however, it communicated neither the softness which is felt when the dura matral covering is distended with fluid, nor the flaccidity which is felt when the fluid has been evacuated : it felt full and firm. On laying open the dura-matral sheath, it was found unusually thick and firm ; seeming to have a semi-cartilaginous structure, superadded to its fibrous, and probably dependent on a deposit beneath its arachnoid lining. This coat, throughout the whole length of the cord, had contracted strong adhesions to the pia mater : in some parts they were nearly general, but at intervals merely partial. Nothing morbid was observed in the structure of the cord itself, except some softening about the middle of the cervical portion. Some of the nerves seemed small, and compressed at their origins.

LECT. IV.

THE varieties and stages of Pericarditis are well exhibited in the Preparations in Guy's Museum arranged under this head. They do not require to be more particularly pointed out individually than has already been done in the Catalogue.

The Case related below will serve as an instance of pericarditis with non-plastic effusion; and the length of its duration will shew that it is not the early stage of that form of inflammation which leads to the formation of cellular membrane.

A BOY, aged 11 years, residing in Turk Street, Spitalfields, a patient of Dr. Hodgkin, at the London Dispensary. Examined 6th of 3d month (March), 1827. He had been in an ill state of health for four years. It was stated, that his complaint commenced on his having the swine-pox: by which term was probably meant chicken-pox, or some modified form of small-pox, which last complaint he had had some time before. His affection consisted of difficult breathing, and uneasiness in the region of the heart, with considerable palpitation; yet he was able to go to school, and to join in chanting, though incapable of uniting in the active exercises of his school-fellows. About eight or nine months before his death, he was a patient in the Dispensary, with the symptoms before mentioned: he was at that time considerably reduced in flesh. Under treatment, which in part consisted of the application of ointment of tartarized antimony to the region of the heart, he so far improved, as to leave the Dispensary, and return to school, from which he had been for some time detained. A few days before his death, he was again brought to the Dispensary. His countenance was pale and livid; his strength and flesh were much reduced; his breathing was more difficult, with cough and copious expectoration, and the palpitation continued. Some medicines were prescribed, and a blister was ordered to his chest. He died in the course of a very few days, without having again applied at the Dispensary. He had walked out not many days before his death; and had not complained of much pain, except about the left hypochondrium. He had often complained of pain and difficulty in passing water.

HEAD.—The head was not examined.

CHEST.—There was some recent inflammation of the right pleura, which was partially adherent. The lung was more dense than natural, and contained some cavities and dilated bronchial tubes; but was much less diseased than the left. The pleura on this side was very generally united by firm and old adhesions: on this side there had also been recent serous inflam-

mation. Imbedded in the substance of the lung, there was a long, thick, and soft fibrinous mass; which, on examination, appeared to have been formed between the lobes, in a space of small extent, in which the surfaces of the pleura had not adhered (p. 128). The structure of this lung, which was much reduced in size, was greatly condensed, and contained several cavities which appeared rather the result of common inflammation than of tubercles; and was traversed by several very much dilated bronchial tubes, which reached almost as low as the diaphragm. They were nearly capable of receiving the end of one's little finger. The parietes were firm and cartilaginous, and their lining membrane was almost of a chocolate colour. The pericardium was thickened, red, and unusually vascular; and contained a thick layer of soft, loose, light-yellow, opake coagulum, not formed into a false membrane (p. 94). The heart was much enlarged. The aorta and its valves were healthy.

ABDOMEN.—The peritoneum exhibited the remains of recent and almost universal inflammation. A soft, light-yellow, opake matter, having scarcely the consistence of a solid, was effused over the intestines, but especially between the convolutions which it feebly united. It had very much the appearance of pus in a concrete form (pp. 47, 150). There was little or no fluid in the cavity. The mucous membrane of the alimentary canal was pretty healthy. The liver was greatly enlarged; but its colour was tolerably natural, and its surface quite so. The change which it had undergone appeared to depend on enlargement of the acini; which, when cut through, exhibited an oblong figure, and appeared depressed in the middle. The fatty degeneration had commenced. The structure between the acini was unaltered. The spleen was of moderate size; and mottled by some defined portions of a lighter colour and firmer texture, not enclosed by a cyst. It appeared to depend on an alteration in the structure of the organ, and not on adventitious deposit. (See a Paper, by the Author, in the Medico-Chirurgical Transactions.) The kidneys were healthy. Nothing was discovered in the bladder to account for the pain on micturition, except that its mucous membrane was a little thickened.

The case of William Hobson, related in the first part of Dr. Bright's Reports of Medical Cases, is a well-marked example of the seabrous deposit on the surface of an inflamed pericardium.

LECT. V.

In the following Case we have an instance of the scabrous form of the product of inflammation upon the surface of the pleura. The quantity of serous effusion, which in such cases is generally considerable, had in this, probably, been absorbed. This Case likewise illustrates some remarks offered in the Sixth Lecture.

JOHN WELSH, aged 15, a patient of Dr. Cholmeley, in Luke Ward, admitted 11th of 7th month (July), 1827. He had been a sailor; and was, at the time of his admission, pale, thin, and of a consumptive appearance. He had been ill some time; having had, whilst at sea, a pulmonic attack, from which he never perfectly recovered: his skin was always rough and dry, and exhaled a very peculiar odour: he had some cough, almost absolutely without expectoration, and could lie on both sides. His chest exhibited a very singular conformation: at the upper part, a little to the left of the sternum, there was a slight depression, of about the size of the palm of one's hand. There was an obvious deficiency of bone and cartilage at this spot, which was thrown into tremulous and palpitating motion by the contractions of the heart. The patient stated this condition to have been congenital. He continued sinking, his complaint assuming more and more of a hectic character; but up to the time of his death he continued to have little or no expectoration. He had not been very recently examined with the stethoscope; but, some weeks before death, his chest afforded an imperfect sound, on percussion, though the respiration was generally audible. He died on the morning of the 24th, and was inspected about five hours after.

HEAD.—The head was not opened.

CHEST.—The third rib appeared to be wanting, from its angle anteriorly. The cartilage was also wanting, except a very small portion attached to the sternum. The space intervening between the second and fourth ribs was occupied by membrane; the intercostal and pectoral muscles being wanting. The pleuræ, on both sides, were much thickened by a firm adventitious membrane, which only partially united the opposed surfaces. The greater part of the surface had a scabrous and honey-comb appearance, similar to that which is occasionally met with in the pericardium: there was very little effusion, but some redness, indicative of recent inflammation superadded to the old. The lungs on both sides were loaded with crude miliary tubercles, accompanied with some tuberculous infiltration near the base of the lung. There were no softened tubercles or cavities: the bronchial and some of the mediastinal and deep-seated axillary glands were converted into large, firm,

white, tuberculous masses, The heart and pericardium appeared to be healthy.

ABDOMEN.—There were extensive remains of peritoneal inflammation; which was of long standing, and had led to the deposition of considerable quantities of tuberculous matter. The upper and the anterior parts were chiefly affected: the viscera and the parietes in many places were glued together. The tubercles were not confined to the adventitious membrane, or to the secreting surface of the peritoneum. The thickened peritoneal coat of the liver was readily torn off; leaving on the gland the impression of numerous small tubercles, which roughened the attached side of the tunic. The peritoneal coat of the intestine, where not adherent, and where no adventitious membrane could be detected, was thickly sprinkled with small tubercles, resembling fragments of boiled rice. The omentum was thickened and contracted, assuming the form of a mass of tuberculous matter, of about two fingers' breadth. The mucous membrane of the small intestines was, in many places, of either a bright or deep red. The edges of the valvulæ conniventes were chiefly affected. The acini of the liver appeared to be enlarged. The organ was large, pale, and soft. The spleen was of moderate size, and accompanied by a small accessory one. The kidneys, and other organs, offered nothing remarkable.

The next Case affords a remarkable example of the tendency to form plates of adventitious bony matter on the attached surface of the pleura costalis.

JAMES TAYLOR, aged 56, examined 14th of 7th month (July), 1827. He had been a hard-working man; and for eight years had been employed in the King's-Head Yard, Borough. He was admitted into Lazarus' Ward, under the care of John Morgan, complaining of difficulty in passing his water, which was supposed to depend on the prostate. It was found, however, that little urine was secreted: and the case being regarded as medical, was transferred to Dr. Back. Two months previously he had taken cold, as he supposed, in consequence of sleeping with his window open. He had for some time been affected with pain and stitches on the left side, especially when carrying weights up stairs; and had also had palpitations, and a sensation of fluttering, as if a bird were in his chest. He had some dyspnœa; and did not lie down without inconvenience, especially on the left side, though he occasionally assumed that posture. He had, at times, disturbing dreams. About five weeks after his seizure, his right leg began to swell; then his right hand and arm; and afterwards his left leg and arm. His

abdomen became ascitic and tense, but the swelling of his upper extremities subsided. His pulse was reported to be irregular, and occasionally inter-mitting. This was, probably, not an invariable state; for it was not noticed when the heart was examined with the stethoscope; which was repeatedly done, in consequence of the *bruit de lime* observable in the contraction of the ventricles. He had some pain on respiration in the region of the heart; and tenderness of the abdomen on pressure, especially at the scrobiculus cordis. His urine continued scanty, or rather diminished in quantity, not exceed-ing a pint in forty-eight hours. He took Pulv. Scammon. c̄ Cal. Pilula Scillæ c̄ Hydrarg.; and other diuretics, as Juniper and Horse-radish. Examined 3d of 7th month (July). The right side of the chest was much more prominent and fuller than the left: resonance was almost or quite wanting, except at the upper part: respiration was very indistinct, but not wholly absent: there was, however, no œgophony, and no protrusion of the intercostal spaces. The ribs on both sides moved freely, during respiration. The left side was resonant, and the respiration was more audible. The im-pulse of the heart was very feeble: a little *bruit de lime* accompanied the contraction of the ventricles.—4th. Symptoms as before.—11th. The upper part of the right side has some resonance: respiration may also be feebly heard; but the sound seems to depend on the tubes, more than on the pul-monary tissue. Considerable bronchophony. Heart as before.

The body was still warm. The abdomen was greatly distended by fluid; a part of which (about ten pints) was withdrawn, for the sake of conveni-ence, before the inspection was proceeded with. On this being done, the right side of the chest was observed to be rather more resonant than it had been a few days before death.

HEAD.—The head was not opened.

CHEST.—On opening the chest, the diaphragm was observed to be pushed up on the right side by the liver, as far as the fifth or sixth rib. The right lung was free from adhesions; and the pleura did not appear at all in-flamed, though there was about a pint and a half of sanguinolent serum in the cavity. The two upper lobes, though rather loaded with blood, were quite crepitant; but the lower was compressed and flabby, and destitute of air; yet, from the appearance of its surface, it had not been long macerating in the effused fluid. On the left side, the pleuritic adhesions were nearly or quite universal: they seemed to be of long standing, but in some parts were much more easily separated than in others. In passing the hand on the inner side of the ribs, to separate the lungs from them, it came in con-tact with several rough and sharp projections of bone of various sizes. The largest was situated at the lower part of the chest, about midway between

the sternum and the spine. To this the lung was firmly attached, and was only separable from it by cutting: the others, to which the lung was much less adherent, were not far from the angles of the ribs. It was at first suspected that they depended on old fractures; but on the thorax being cleared, they proved to be projections from a large and strong layer of bony matter situated immediately behind the pleura, and separated from the ribs by a loose cellular structure, which admitted of considerable motion. It was broadest at the posterior part, becoming rapidly narrower towards the anterior part, and terminated in the large mass before mentioned. (Vide Preparation, 1776.) The left lung, as well as the right, was crepitant; and free from tubercles or other adventitious matter. The two surfaces of the pleura were pretty firmly connected by old adhesions; but the cellular structure, which they had formed, might be torn through without much force. The heart was large, firm, and blunt at its apex. There were a few small spots of bony matter on its surface. A large mass of the same kind in the parietes of the right auricle, but nearer to its inner than to its outer surface. There was a little thickening about the edges of the mitral valve. The cup-like cavities of the semilunar valves were nearly filled by osseous vegetations; and on looking into the vessel towards the heart, they appeared perfectly closed; yet it did not appear that the resistance to the passage of the blood from the heart had been very great, for the parietes of the vessel, yielding to receive the bony masses, allowed a pretty wide passage. The aorta was somewhat dilated, and, throughout its whole course, sprinkled with broad bony patches: there were also patches of extravasated blood, and of a darkish grumous matter, behind the lining membrane, which in some places was abraded: there were some clots of coagulated blood in the most diseased parts, but the greater part of the vessel was free from them. A tendency to ossification was evinced by a considerable increase of thickness in many of the arterial branches: this was particularly the case with the hepatic artery, even the smaller branches of which were so firm, that they might be torn away from the substance of the liver. The emulgent arteries were also much thickened.

ABDOMEN. — The mucous membrane of the stomach was a little discoloured, and rather soft, but thickened. That of the small intestines, both small and large, was pretty natural, but covered with a good deal of thick mucus, which, in some parts of the small intestines, was of a light greyish colour, like the membrane beneath it. The liver was not at all enlarged; and its structure, notwithstanding the state of the arteries, was pretty healthy. The spleen was small; and, with the exception of some adhesions about its tunic, and the more than usual redness of its substance, was

healthy, as were also the pancreas and kidneys. The ureters were not at all enlarged, nor did the bladder appear to be so : it may therefore be reasonably supposed that there was little the matter with the prostate, though this gland was, unfortunately, not examined.

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LECT. VI.

THE remarks on the morbid appearances which are met with in the peritoneum might easily have been extended to a greater length than I have thought it necessary to give to them in the Lecture on that subject. Most, if not all of these appearances, may be referred to some of the principles which are laid down in the Second Lecture. The detail of a few characteristic cases may nevertheless be given by way of illustration, and to compensate for some deficiencies, by affording the opportunity of noticing minor peculiarities. The case of James Vaughan, in whom there was evidently recent peritoneal inflammation in conjunction with the remarkable condition of the alimentary canal, affords an instance of the muciform secretion of serous membranes which occurred both in the chest and abdomen. The lines of redness, and increased vascularity in the peritoneal surface of the intestines, when the convolutions were applied to each other, are worthy of observation. They are by no means uncommon in cases of recent acute peritonitis ; and it is in the course of these lines that the product of inflammation, whether plastic or puriform, is often collected.— The peculiar condition of the mucous membrane of the intestines will require particular notice in the Second Volume, in which the affections of the mucous membranes are to be brought under consideration.

JAMES VAUGHAN, aged 30, a patient of Dr. Cholmeley, in Job Ward, admitted 31st of 1st month (January), 1827. He was a workman engaged in a lead-mill, in which kind of occupation he had been engaged but a short time. He had previously had good health. About ten days before his admission, after five days' constipation, he was seized with violent, obstinate pain of bowels. Leeches were applied ; purgatives, combined with opiates, were given, and an evacuation from the bowels was obtained : after which he was for two or three days tormented with a very irritable state of bowels, passing as many as twenty-five dejections in the course of the day and night : they were mixed with blood and dark coagula. At the same time,

he had urgent retching, great pain and tenderness of the abdomen, and a quick pulse. The tongue moist, and very pale. He died on the morning of the 10th of the 2d month (February), and was inspected the same day.

HEAD.—The head was not opened.

CHEST.—The pleura was perfectly free from adhesions; but the secretion which lubricated it was remarkably viscid, exciting, when handled, the idea of mucilage (p. 30). The lungs were generally soft and crepitant, but a little œdematous. Near to the summit of the right, a portion, about the size of an egg, but imperfectly defined, was considerably firmer than the rest: when cut into, it was seen to be of a light colour, nearly devoid of air, but it contained a considerable quantity of thin, watery fluid.

The heart and pericardium were healthy.

ABDOMEN.—The peritoneum was covered with a secretion of a viscid and mucilaginous character (p. 30); exhibiting, at a few points, a slight tendency to the formation of adhesions. The secretion, like that of the pleura, was not in sufficient quantity to assume the form of a fluid. The peritoneum was, in many parts, of a pink colour, from the injection of minute vessels : this was particularly the case where the convolutions of intestine were in contact with each other. The mucous membrane of the stomach was pale, and, to all appearance, healthy: that of the duodenum, and a great part of the jejunum, also appeared healthy ; but in the ileum, especially towards its termination, the mucous membrane was somewhat injected, and of a venous colour : it was extremely soft, being readily scraped off from the subjacent coat : this was particularly the case in the situation of the glandulæ aggregatæ, which were not at all thickened. The fœcal matter in this part of the intestine adhered to these spots, and, on attempting to remove it, the mucous membrane separated with it. The edges of many of the valvulæ conniventes were in a similar state : they were tinged with yellow, from the adhesion of a very small quantity of fœcal matter ; and at the very edge there appeared to be some loss of substance in the mucous structure. In some parts of this intestine, the mucous secretion appeared to have been greatly deficient ; and in these, the fœcal matter was in the form of dry and compressed particles. The large intestine from the valve, nearly to the end of the sigmoid flexure, was much thickened and indurated, feeling like a semi-cartilaginous tissue between the blades of the enterotome. Its calibre was a little contracted : the rigid structure had acquired a permanent uneven surface—due, apparently, to the irregular action of the middle coat—similar in kind to that which produces the pouches of the colon. The internal surface presented a very unusual and mottled appearance. The prominent portions, which were tolerably smooth, were partly black, and

partly of an ochre yellow colour, from the dead mucous membrane, which still more or less adhered to them.   The dead mucous membrane might be readily detached; and its loose and ragged edges were very apparent, when the intestines were immersed in water.   The intervening portions of intestine appeared perfectly void of mucous membrane; and were of a greyish colour, and uneven surface. This diseased state was most marked at the commencement of the large intestine; and gradually passed off towards the last part of the sigmoid flexure of the colon, where the mucous membrane was merely rather grey and spotted.   One of the mesenteric glands, near the jejunum, was rather enlarged, and of bony hardness.   The liver was healthy; the spleen small and soft; the pancreas and kidneys were healthy.   The bladder was distended with urine.

The abdomen, before it was opened, was tense, and perfectly flat; and on the muscles being divided, they so far retracted, that the cut edges could not be brought in contact by more than an inch.

The points of interest in the next Cases are sufficiently indicated by the references to the pages of the Lecture which bear upon them.

ELIZABETH SWINDON, aged about 40, a patient of Dr. Bright, in Dorcas Ward, examined 21st of 6th month (June), 1826. She had been affected for some months with ascites. She had been for a considerable time a patient in St. Thomas's Hospital, under Dr. Elliotson.   She had been repeatedly bled and had taken mercury to salivation. Her appearance was thin and pale, and there was œdema of the lower extremities.   Her pulse was small, but quick and sharp. She had at times considerable tenderness of the abdomen. After her admission, she was again repeatedly bled by the lancet and by leeches. About four ounces, taken on one of the last days of her life, afforded a very small proportion of crassamentum, which was remarkably contracted and cupped.   A few hours before death, she lay in an apparently comatose state. She had been once tapped about a week before her death.   The left leg was considerably œdematous.   The subcutaneous fat was almost totally absorbed.

HEAD.—On removing the brain for demonstration, the dura mater was found remarkably and strongly adherent to the cranium; especially in some points, in which the bone appeared to have been diseased, and to have suffered from absorption.

CHEST.—The lungs were crepitant, and free from adventitious deposit: there were some adhesions, about the base of the lungs, to the diaphragm and inferior parts of the sides of the thorax.   There was nothing remarkable in the heart.

ABDOMEN.—The abdomen was much distended. Upwards of two gallons of remarkably colourless and clear serum were removed from the peritoneal cavity: it appeared to be quite free from flocculi of coagulated lymph. A thin adventitious membrane was spread over the peritoneum of the parietes; and there were some traces, though less distinct, about that of the intestines. The omentum was small, somewhat contracted or corrugated (p. 152). A cord-like adhesion connected it to the colon, in the right iliac region. It had a similar, but much shorter connection, on the left. The convex surface of the liver, and a part of the gall-bladder, stomach, and spleen, were connected by numerous, long, filamentous, and well-organized adhesions to the peritoneum, lining the diaphragm and upper part of the abdominal muscles (p. 156). The adventitious membrane covering the peritoneal coat of the liver was of rather an opake white colour, and unequally thick; and had, from this cause, a honey-comb or worm-eaten appearance (p. 159). The liver was small, its surface uneven, its colour extremely pale yellow, and its texture much indurated, apparently from change in the interlobular cellular tissue. It had continued to secrete bile of a pretty natural character. The spleen was rather large and pale. The coats of the stomach and intestines were not particularly thickened, or otherwise altered. The mucous membrane was generally pale. The kidneys appeared healthy. The uterus was remarkably small: the os tincæ little prominent, and furnished with a very small opening. The ovaries were small, smooth, and flaccid; and so altered in structure, as scarcely to be recognisable. The left appeared merely to consist of one small cyst. In the right were two corpora lutea. The Fallopian tubes closely adhered to the surrounding parts (p. 157). The extremities towards the ovaries were dilated so as to resemble, in some degree, the petals of digitalis, and retained but little appearance of fimbriæ.

MARIA BOLTON, aged 40, a patient of Dr. Bright, in Dorcas Ward, inspected 2d of 12th month (December), 1829. She was a married woman, but did not appear to have ever been pregnant. She had previously been a patient in the hospital. She had at that time a tumid abdomen; in which, although there was peritoneal effusion, it was thought, even by the patient herself, that pregnancy was probably concerned. On this account she left the hospital, somewhat relieved; but was again obliged to apply for admission. All suspicion of pregnancy disappeared: the effusion into the abdomen was so great as to occasion painful distension. She was twice tapped. The fluid drawn off was nearly colourless, clear, and serous, but did not coagulate by the application of heat. She continued declining; and died, considerably emaciated.

HEAD.—The head was not examined.

CHEST. — The pleuræ were very free from effusion or adhesion ; but the lungs were a good deal compressed by the elevation of the diaphragm. The pericardium was healthy. The heart was small, but its base was remarkably broad in proportion to the length of the ventricles.   The parietes were of natural thickness, and the cavities not quite empty : the valves were healthy.

ABDOMEN.—The abdominal cavity contained upwards of a pailful of nearly clear, straw-coloured serum, in which were some flakes of tender lymph. The fluid shewed no disposition to coagulate, on its removal from the body.   A thin, false membrane covered the intestines ; and was in some places raised by serum, so as to resemble cuticle raised by a blister (pp. 52 & 140). There were some irregular, pellucid vesicles in the neighbourhood of the Fallo-pian tubes, which appeared to be of the same nature. There were numerous short, but stout and strong, old adhesions between the diaphragm and the convex surface of the liver (pp. 156 and 52) and spleen.   Some of the spaces left between these adhesions were occupied by clear, thin, serous cysts, of an irregular figure, like those in the pelvis : they were of an elon-gated form, and were only attached at one extremity. When the contained serum escaped, they seemed to be merely a small, thin film of cellular mem-brane.   The alimentary canal did not offer any thing remarkable.   The mesentery was shortened (p 152).   The liver was firm and contracted, and of an irregular figure : its tunic was considerably thickened.   When cut into, it exhibited a mottled appearance, of a lightish yellow colour.   The acini were condensed into the form of rounded grains, easily detached ; and the intervening cellular structure was firm, thickened, and semi-carti-laginous.

J. T. GRINDLEY, a patient of Dr. Back, in Job Ward, admitted the 22d of 1st month (January), 1828. Examined 2d of 5th month (May), 1828. He was affected with dropsy, and the effusion into the abdomen was consi-derable.   He had at times suffered diffused pain of abdomen, but it did not appear to be very acute. He had been a man of intemperate habits ; which, together with a defined induration in the epigastric region, favoured the idea of his having diseased and enlarged liver.   There was a tumor under the jaw, on the right side, which was reported to have existed for some years.

HEAD.—The head was not examined. The enlarged gland under the jaw exhibited numerous small points of commencing suppuration or softening.

CHEST.—There were some traces of old pleuritic inflammation.   There were tubercles in the right lung, and some appearance of recent inflamma-tion.   The heart offered nothing remarkable.

ABDOMEN.—On opening the abdomen, a large quantity of clear yellow serum was found in the peritoneal cavity. The intestines were concealed from view by a smooth false membrane, which closely invested them, kept them from falling into the pelvis, and formed a large, defined, and nearly spherical tumor (see a diagram by C. J. Canton), behind which one could pass one's hand almost to the vertebral column (p. 140). The fluid was wholly collected between this sac and the parietes ; and there were likewise situated between them, more particularly in the pelvis, numerous thin and tender false membranes. The intestines, somewhat distended with gas, were glued together by adhesions ; which, in some parts, were stronger than the connection between the peritoneal and muscular coats. The omentum was reduced to a slender, tough, leaden-coloured mass at the upper part of the tumor, and lying along the convexity of the colon. There was nothing particularly remarkable in the alimentary canal. The liver was not so concealed as the intestines ; but it appeared somewhat contracted, under a thick and compact false membrane, which was nearly opake, whitish, mottled with bright red, though not presenting distinct vessels, and, notwithstanding its density, was easily broken through. The liver itself was pretty natural in colour, but rather granular and firm. The spleen was soft, and, like the liver, covered with false membrane, which adhered much more firmly to the tunic of the organ than this latter did to the parenchymatous structure. The kidneys exhibited a slight degree of the mottling degeneration. There was some clear urine in the bladder ; and on the application of heat, it became turbid.

MARY TARBUCK, aged 40, a patient of Dr. Cholmeley, in Martha Ward, admitted 12th of 11th month (November), 1826. She was thin, and much reduced by hardships, having laboured under a deficiency of the necessaries of life. Her principal symptoms were, pain of the abdomen, diarrhœa, and urgent vomiting ; besides which she had a good deal of cough, which disturbed her rest. A blister, and subsequently leeches, were applied to the abdomen. Starch glysters, small doses of castor-oil, and opiates, were given, without success, to remove the diarrhœa : and, with the hope of relieving the vomiting, which was of a very bilious character, soda-water and brandy were allowed. The body was examined 18th of 12th month (December).

HEAD.—The head was not opened.

CHEST.—There were some old pleuritic adhesions on the right side, at the summit of the upper lobe, and at the base of this lung. There were scarcely any traces of the kind on the left side. Both cavities were remarkably free from fluid. The substance of the lungs was free from adventitious deposit ;

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except at the uneven summits of the upper lobes, in the substance of which were lodged a few small, hard, rounded bodies, in which no trace of tuberculous matter was detected.   The heart was small, and apparently healthy. There were one or two small white patches on the close pericardium, situated, as usual, on the part nearest to the sternum.

ABDOMEN.—Almost the whole surface of the peritoneum exhibited the marks of chronic inflammation.   The omentum adhered partially to the parietes; more generally to the intestines; and was firmly attached to the lower part of the pelvis.   The intestines were glued together; and a considerable part of the surface, both of the liver and spleen, were connected by adhesions to the adjacent parts.   These adhesions were, for the most part, of a grey, leaden, or blackish colour; sufficiently tender to be torn through without much difficulty: but, wherever the product of inflammation was most abundant, there small, circumscribed abscesses were formed (p.143); as, for example, between the omentum and the parietes, between the convolutions of the intestines themselves, and between them and the pelvis.   The most considerable of these occurred where the portion of small intestines adhered to the side of the pelvis, to the right of the bladder :   the peritoneum here appeared ulcerated through :   the abscess, however, was, even there, circumscribed; and the pus shewed no disposition to burrow in the neighbouring cellular membrane.   The coats of the intestines were nowhere ulcerated through, but they were generally so tender as to afford but little resistance to the finger passing through them.   In some parts, the peritoneal coat, in others the mucous, tore readily from the muscular.   Both of these states were most remarkable in the large intestines.   The mucous membrane of the stomach was generally pale; but towards the cardia it was brown and softened : that of the first part of the duodenum was thickened, and uneven.   In the remainder of the duodenum, jejunum, and part of the ileum, it was tinged with bile.   It was somewhat softened in the remainder of the ileum; and the glandulæ aggregatæ were distinct, and of a leaden hue.   The substance of the liver was pretty healthy, but contained a good deal of blood.   The gallbladder was filled with dilute, saffron-coloured bile.   The spleen was small, and very lacerable : the kidneys small and pale.   The substance of the uterus was considerably indurated : its exterior, and its appendages, considerably involved in the peritoneal adhesions before mentioned.

WILLIAM TRIMBEY, a patient of Dr. Back, in Naaman Ward, examined 12th of 7th month (July), 1826.   No history of the case has been preserved.

HEAD.—The head was not opened.

CHEST.—There was some little adhesion of the right lung, at the upper part. No effusion into the cavity. The substance of the lung erepitant; but thickly sprinkled with miliary tubercles, of about the size of vetch seed, of rather a firm structure, and somewhat transparent: they appeared to be all similarly advanced. The adhesion of the pleura on the left side was universal, like that of the integuments to the parts they cover; but, excepting posteriorly, the adhesions were easily torn through. Nothing remarkable was discovered in the heart.

ABDOMEN.—There were various elongated and organized adhesions between the peritoneum covering the liver and the parietes of the abdomen (p.156); also between the spleen and the parietes. The liver was somewhat paler and firmer than in the healthy state. Imbedded in its substance, there was a small concretion, partly earthy, and partly of a semi-cartilaginous structure. On the surface of the organ corresponding to this deposit, the peritoneum was thickened, and puckered to a small extent. The spleen was large. A thin membrane connected the mesentery of two contiguous convolutions of intestines: at its border furthest from the spine, where it extended from one part of the intestine to the other, it formed a kind of cord; and at each extremity of the intestine itself there was a slightly yellow, opake tumor, produced by a deposit beneath the false membrane. This deposit was of the consistence of thick cream; and might readily be made to pass along the cord-like edge of the above-mentioned membrane, which formed a complete duct, of the size of a crow-quill. (Preparation 2367; and pp. 52 & 143.) The stomach and intestines were more vascular than usual. This was particularly the case in the duodenum, in which the free edges of the valvulæ conniventes were of a bright red. The pancreas appeared healthy. The appearance which, before his removal from the ward, had given rise to the suspicion of hernia on the left side, was found to depend on a disease of the testis and cord. The epididymis was indurated, swollen, and of an irregular figure: that on the right side was similarly affected, but to a less extent. The vas deferens was swollen, at intervals, to the size of a horse-bean; and contained a soft, opake, yellow substance, resembling tuberculous matter in the first stage of softening.

The case of Andrew Dennis was one in which the product of inflammation of the peritoneum was of the least plastic character. Its connection with stricture, and the almost total absence of abdominal pain, are worthy of attention.

ANDREW DENNIS, aged 40, a patient of J. Morgan, in Job Ward, admitted 23d of 7th month (July), 1826. He was admitted with stricture.

The stricture was extremely firm ; and considerable violence having been used in passing the catheter, there was every reason to believe that a false passage had been formed.   On the 5th of 8th month (August), he became extremely ill ; his pulse very small and quick ; his countenance pale, and ex-pressive of anxiety ; he had rigors and sickness.   Peritoneal inflammation being suspected, leeches were applied to the abdomen ; but it was not deemed expedient to take blood from the arm.   Though perfectly sensible, he made little complaint of pain ; and his position, approaching to the erect, did not seem to indicate much peritoneal tenderness.   He died on the night of the 6th, and the body was inspected the following day.

HEAD.—The head was not opened.

CHEST.—The pleuræ were free from adhesion.   The lungs were soft and crepitant.   The air-cells were pretty generally dilated ; and there was a good deal of interlobular emphysema, producing the appearance of bladders on the surface of the lungs.   The substance of the lungs was free from adventitious deposit, except black pulmonary matter and a small cretaceous tubercle in the left.   There was nothing remarkable with respect to the heart, except a small white patch on its surface.

ABDOMEN.—The peritoneum, especially where covering the intestines, was minutely injected : its surface was everywhere bathed with a puriform fluid of a dirtyish-yellow colour, but there was not the slightest tendency to adhe-sion (p.150).   The mucous membrane of the stomach was in some parts much softened, and readily separable, nearly in the form of mucus.   It was mottled, in the form of reddish-brown, especially in the neighbourhood of the vessels. The mucous membrane of the duodenum presented large, irregular, bright and vascular spots ; and its surface was rendered uneven by numerous small yellowish bodies, apparently enlarged follicles.   Except some increased vas-cularity in the ileum, the remainder of the intestinal membrane appeared to be healthy.   The other coats of the intestines were not thickened.   On the upper surface of the right lobe of the liver was an irregular light-coloured spot, of the size of tho palm of one's hand, and formed by a thin layer of a firm texture immediately beneath the peritoneum, which firmly adhered to it, but which did not itself appear to be thickened.   The substance of the liver contained a good deal of blood, but was in other respects healthy.   The pancreas seemed quite healthy.   The spleen was remarkably small ; and its texture, which was very soft, was of a light lilac internally, but dark, ap-proaching to black, towards the surface.   The kidneys contained much blood, with some appearance of ecchymosis.   The ureters were of their natural size.   The bladder contained some coagulated blood, but its lining membrane was not unhealthy.   The stricture existed about two inches anteriorly to the

membranous portion of the urethra. At this part, the urethra, for the space of an inch and a half, was detached from the surrounding parts. The surface of the cavity which this separation produced was perfectly black, and the neighbouring tissues, to a slight depth, were of the same colour. A similar appearance was continued throughout a false passage, which commenced at this point, and passed by the side of the natural passage, and, for some distance, by the side of the bladder, almost between it and the rectum. There was some appearance of a second false passage having been commenced through the prostate, but it was of very little depth. The cellular membrane subjacent to the peritoneum, in the anterior part of the pelvis, was extremely lacerable; and a purulent fluid, slightly tinged with blood, was diffused through it.

The interest of the next case principally consists in there having been two distinct attacks of inflammation of the peritoneum: the first partial and circumscribed, which appears to have been excited by the ulcers in the lower part of the ileum: the second general, and much more recent, which may not improbably have been occasioned by the escape of a very small quantity of the unhealthy secretion contained in the circumscribed cavity.

EDWARD MIDDLETON, aged 22, admitted into Lazarus Ward, under Dr. Back, 6th of 10th month (October), 1830. He died of peritonitis, a short time after his admission. The body, which was still warm, was pale, and exhibited little appearance of emaciation.

HEAD.—The head was not examined.

CHEST.—The pleuræ were tolerably healthy, merely presenting a few old adhesions. The lungs were pretty healthy, free from adventitious deposits, but the bronchial tubes were loaded with mucus. The heart and pericardium were healthy.

ABDOMEN.—The abdomen, which was slightly distended, exhibited the most extensive effects of recent peritonitis, every part being covered by puriform serum and flakes of opake yellow lymph: the latter, which was chiefly found where spaces intervened between contiguous convolutions and the other viscera and the parietes, slightly adhered to the highly vascular but apparently smooth and unbroken peritoneum, beneath which, in some parts, it presented numerous minute bloody points. The peritoneal covering of the stomach was pale; and the products of inflammation on this organ seemed rather to have been conveyed to it, than formed upon it (p. 158). The folds of the mesentery were feebly glued together. The convolutions of intestine did not completely fall into the lower part of the pelvis;

and between them and the sides of the pelvis, and quite the lower part of the abdominal muscles, there was a very feebly circumscribed cavity, containing a discoloured turbid serum of an offensive odour. The lymph which covered the portions of convolutions of intestine which concurred to form this cavity appeared to be, in part, a deposition from this fluid. It was by no means thin; and presented a few irregular fissures, forming a complete contrast with the lymph in other parts of the abdominal cavity. The mucous membrane of the stomach, which contained a good deal of dingy green, bilious fluid, was, to all appearance, healthy, exhibiting merely a very faint pink or flesh-coloured blush. The mucous membrane of the intestines was generally healthy; except the last eight or ten inches of the ileum; which was the seat of numerous deep ulcers, that, in one instance, seemed to have completed a small perforation : but as the intestine at this part was opposed to another convolution, to which it was feebly united by recent adhesion, it is not probable that any fæcal matter had escaped. In some other points, the ulcerations had only left the peritoneal coat, which appeared to be in a state approaching to gangrene. The appendix cæci was rather swollen, but not concerned in the formation of the circumscribed cavity. The other viscera offered nothing particular to require notice.

The next case is one of loose defined rounded body in the peritoneal cavity. The remark respecting the state of the mucous membrane in the case of J. Vaughan is applicable to this case also.

JOHN STEDMAN, aged 33, an athletic man. He was admitted 24th of 11th month (November), 1828, into Lazarus Ward, under Dr. Cholmeley. He had been a plumber. When a young man, he went to Canada, where he followed his business for two years : he then, about eight years before his death, travelled through a considerable part of the continent of America, and had the yellow fever. Three years after, when at work as a plumber in London, he became very eccentric; would walk all night in the country, though he had a home; and in one of his more violent fits, he wounded himself considerably. He was otherwise regular in his habits. " Spirits made him mad."

> Appl. Empl. Lyttæ pectori.
> Pil. Scillæ c̄ Hydr. Digit. et Extr. Papav.

From auscultation on the 26th, it was remarked, that, anteriorly, the sonorous rattle was general : posteriorly, some crepitating rattle, most likely from pulmonary œdema or apoplexy.

27th. Great depression, anxiety, and paleness : abdomen painful, and

very tender. Pulse 104, contracted, and rather hard : respiration 44, difficult and painful : cough short and frequent : mind collected.

29th. Pulse 106, hardish and small : respiration 44, laborious, and more gurgling, both in the lung and trachea. Has slept ill. Bowels very frequently open in bed. Pain still continues.

During the 30th he continued much the same, his bowels being open every ten or fifteen minutes, and the stools fetid. He died on the following day, at 4 A.M.

SECTIO CADAVERIS, nine hours after death. The body appeared generally anasarcous.

HEAD.—The glandulæ Pacchioni externæ were unusually large. There was rather more serum than is usual between the membranes. The blood-vessels of the pia mater were not very turgid ; but the blood which they contained was florid, almost like that of an artery. The right corpus rhomboideum, instead of its ordinary grey colour, was of an ochre yellow, and of a soft consistence, easily broken down.

CHEST. — The cellular membrane was watery. On the right side of the chest there was a small quantity of recent effusion, and partial old adhesions of the pleura. Where these adhesions did not exist, the pleura pulmonalis was easily torn from the lung. The substance of the lung was rather œdematous : it was generally pervaded with air, and crepitant. There was a slight general appearance of emphysema ; but as none of the air-cells were much dilated, this appearance probably depended on the state of the bronchial tubes, which were obstructed with viscid mucus, and bore marks of inflammation of the mucous membrane. The back part of the lung was pretty thickly sprinkled with small, dull red spots, in which extravasation appeared to have taken place. On the left side of the chest there was very little more effusion. The pleura was very nearly, if not absolutely, free from adhesions. The lung and bronchial tubes were in the same state as on the right side ; but the red spots were not so conspicuous. The heart was not hypertrophied : about a quarter of a pint of serum was found in the pericardial cavity. There was a slight and partial opacity of one of the curtains of the mitral valve. The blood in the heart was generally fluid ; but in the left ventricle there was a coagulum, the greater part of which was of remarkably white colour, and appeared to be nearly pure fibrine.

ABDOMEN.—There were several pints of serum in the abdomen, and a few recent flocculi of adventitious membrane at its upper part. A hard nut-like tubercle, consisting internally of a fine yellowish, slightly earthy substance in a thin bony shell with a very thin, semi-cartilaginous covering, was found perfectly unattached in the greater omentum, which was thin, and

its layers distinct (p. 161).   The omentum presented one small indurated spot, black internally, and which appeared to be a cicatrix.   The stomach was pretty healthy.   Under the mucous membrane of the jejunum, especially under its valvulæ conniventes, was an effusion of dark blood.   The arch, and part of the sigmoid flexure of the colon, were remarkably sacculated, from the strong contraction of its muscular fibres.   It had a mottled dark colour externally; which depended on the state of its internal surface, which was of a very dark or nearly black colour, with a tinge of olive.   It was extremely irregular, corresponding in some degree to the irregular contractions observed externally.   Those parts which projected internally were smooth and rounded; but a thin, dark, dead membrane was easily separated from them: the cellular structure had a dirty yellow tinge.   In the depressions, the mucous membrane appeared to have been already, for some time, partially removed by ulceration.   The peritoneum covering the liver was rather striated: the liver itself was large and engorged: its substance healthy.   The spleen was also gorged.   The kidneys were large: their substance pale and soft; and their surfaces covered by minutely injected, meandering vessels.   These organs, though somewhat mottled, were much less so than is generally the case with the white deposit which accompanies coagulable urine.   This white deposit was rather diffused.

The bursæ formed on the patella are not merely liable to become the seat of inflammation, by which false membranes, adhesions, bridles, and various irregular growths are produced on the polished or internal surface (see p.179): but the product of inflammation on the attached surface, in some instances, produces a semi-cartilaginous structure, of nearly a third of an inch in thickness (see Preparations 1375, 1375^A, and 1375^B).   Such cases, which are the result of chronic inflammation, are analogous to the great thickening of the reflected portion of the tunica vaginalis, in some cases of old hydrocele.   (See p.176, and Preparation 2381 ').   The probable cause is the same in both situations, viz. the constant renewal of irritation from external influence.

LECT. VII.

In Cruveilhier's 19th Livraison, Plate II. fig. 1. 3. 4. 5. 6. 7. are delineated examples of acephalocysts possessing the modification of form described at p. 190 as dependent on the outer layer of the hydatid. Since this Lecture was printed, I have witnessed the inspection of an extraordinary case of this species of hydatid, which had been of several years' duration, and had occasioned great distension, and invaded every part of the abdomen. In this case, several of the junior hydatids had assumed a very remarkable and irregular figure, in consequence of mutual compression.

The following cases appear to be instances of abscess occasioned by the existence of an old and condensed hydatid cyst after the death and contraction of the proper hydatid membranes. It is probably a much less rare occurrence for acephalocysts to give rise to abscess at an earlier stage, when the membranes have but recently lost their vitality, especially if the tumors have been punctured, and the hydatids have been only imperfectly withdrawn.

William Aylwart, aged 34, a patient of Dr. Bright, in Luke Ward, admitted 7th of 4th month (April), 1830; examined 19th of 5th month (May), 1830. He was affected with some degree of jaundice, and pain of side. The jaundice, to a great degree, subsided, but his countenance continued pale and yellowish. A flattened tumor, somewhat larger than an orange, appeared at the scrobiculus cordis. It made its way towards the surface, and was soft and fluctuating in the centre, around which was a somewhat indurated margin. He had been cupped at this part; and it seemed probable that the scarifications would favour the formation of an external opening, and render the use of the lancet needless. The patient, however, complained of so much oppression, that it was thought expedient to make an opening. It was opened; and a thin and excessively offensive matter escaped, having the characteristic odour of gangrene. Very little relief followed, and the patient shortly afterwards expired.

The parietes of the abdomen were firmly adherent to the surface of the liver, for some distance around the orifice. The adhesions were old and firm, almost semi-cartilaginous. The liver was remarkably large, principally from the unusual size of the left lobe : the surface was smooth ; and the structure throughout was very characteristic of hypertrophy of the acini, without sensible alteration of the intervening cellular membrane : the colour was little altered, but perhaps rather darker than is quite natural, from congestion. The sternum having been raised, a vertical

section was made, both upwards and downwards, from the opening in the abscess. This exposed a cavity in the liver, capable of holding a moderate-sized orange : it was irregular : the substance of the liver at the part was broken down, dark-coloured, and highly offensive : the cellular membrane of the parietes, where not indurated, was sphacelating. The upper part of the incision laid open the pericardium, which was immediately opposed to the abscess, the diaphragm alone intervening. The pericardium was distended with turbid, puriform fluid, mixed with opake flakes of ragged lymph (p. 93). The surface of the heart was covered with a thin and some-what scabrous, false membrane (p. 96) : it was beneath the flakes of lymph, and was pretty firmly adherent to the close pericardium. The reflected portion exhibited considerably increased vascularity, but was only partially covered with false membrane. Adhesions between the parietes of the abdomen and the convex surface of the liver, and portions of a dense semi-cartilaginous structure, of a whitish colour, to the right of the before-mentioned tumor, seemed to indicate further derangement in the substance of the liver : and, on cutting into it at that part, two cavities were disco-vered ; the smaller and anterior one of the size of a walnut, containing puriform mucus ; the larger, the size of an orange, containing a more dirty and offensive, but thickish fluid. The diaphragm adhered to the base of the lung, by means of a short but loose cellular membrane, in which numerous straight and parallel vessels were seen passing from one surface to the other, between the lung and diaphragm. The parietes of these cavities were dense, semi-cartilaginous, of whitish colour, and somewhat transparent : the internal surface was granular. In the larger cavity, there was a ragged fragment, of a dense, irregular membrane : it was tough and ligamentous, with a slight intermixture of bony matter ; and was of a whitish colour, mottled with spots or patches stained with bile. It had nothing of the character of an hydatid membrane ; and it seems difficult to account for so complete a detachment.

There was no other appearance in the contents of either of these cavities which seemed like the débris of hydatids, yet it is not easy to assign any other origin to them (p. 196). In the lower part of the abdomen, between the folds of the mesocolon, near the right iliac region, there was an irre-gularly-rounded tumor, about as large as a moderate-sized orange : it was of a nearly white colour, and cartilaginous structure. On cutting into it, it was found to contain several hydatids, of the genus acephalocystis ; some of which were still distended, and apparently living ; others folded together, and appearing to have died a considerable time before the death of the subject. They were a little discoloured, but retained a good deal of transpa-

rency. On the internal surface of two of the larger living hydatids were large, irregular, cauliflower-shaped elevations; one on each: they were firmly adherent, and were of an opakish, white colour. There did not appear to be any other morbid or preternatural appearance; except that in the pelvis there was a little clear serum, and some tender films of transparent lymph.

Antonio Masshye, a patient of Dr. Bright, in Lazarus Ward, examined 9th of 8th month (August), 1831. He was a Portuguese, who, it appeared, had served in our army or navy. He had been ailing for some time before his admission, and laboured under disease of the chest. His countenance was rather sallow and icteritious. His abdomen was rather distended; and the epigastric veins were so remarkably enlarged, as to induce, in Dr. Bright's mind, the suspicion that there was some cause of obstruction in the cava.

This appearance of the veins had disappeared in the dead subject; and the only remarkable external appearances were the numerous and gay marks which he had indelibly fixed in the skin of the arms &c. Some of them were such as to evince at once his superstition and sensuality.

Head.—The head was not examined.

Chest.—The right side of the chest exhibited the effects of pleurisy. From the thickness of the product of inflammation, which was equal to that of a half-crown piece, and from its nearly semi-cartilaginous firmness where in contact with the subjacent parts, the pleuritis must have been of long standing (p. 104); but the character of recent inflammation was still present on the surface of the false membrane, in contact with the fluid effusion (pp. 48 and 50.) This surface was soft, tender, and semi-transparent; and reddened by interspersed red spots, which appeared to be produced by ecchymosis, rather than (see Drawing) by the presence of already-formed vessels.

Abdomen.—The iliac veins and lower part of the aorta were not obliterated. A cyst existed at the posterior part of the liver; so situated as to press upon the cava, which was obliterated at that part. This cyst was filled with a dark-brown, ochreous mass, mixed with ragged shreds of a tough, fibrous membrane and irregular plates of bone, which appeared to have been produced by the partial ossification of the fibrous membrane. Some of the shreds and bony plates were adherent to the parietes of the cavity containing them, whilst others were detached. (See Preparations.) Little or no doubt existed that these appearances were produced by an old hydatid sac (p. 196).

LECT. VIII.

THE following case of encysted dropsy appears to have been occasioned by the formation of a large simple serous cyst in the folds of one of the broad ligaments, or in one of the ovaries. It is remarkable for the twisting together of the cervix uteri and round ligaments, occasioned, in all probability, by a kind of spontaneous revolution of the cyst. It appears that a considerable degree of inflammation had long existed in the interior of the cyst.

JANE HUDSON, aged 26, admitted into Charity Ward on the 17th of 1st month (January), 1828. A patient of C. A. Key. Five years ago, being one month after her confinement, she discovered a tumor situated on the right side. It was supposed to be occasioned by a collection of fæces; and purgatives were given without producing any effect on the tumor. Soon after the appearance of the tumor, her urine became scanty. Her health improved; and continued good till eight months after the birth of her second child, at which time it died: she was suckling it at the time. The tumor now began to increase, and she suffered much from hysteria. The menses were profuse. This state of things continued till about eight months ago, when again she became pregnant, but miscarried about the third month. When admitted into the hospital, the tumor was so large as to impede her walking about. Her health was much impaired, and she had frequent hysteric fits. She was tapped on the 4th of 2d month (February), but part only of the fluid (four quarts) was drawn off. She was carried off by peritonitis.

HEAD.—The head was not examined.

CHEST.—The lungs and pleura, and the heart and pericardium, were remarkably healthy.

ABDOMEN.—In the abdomen, there were extensive marks of peritonitis. The adhesions, which extended over the whole of the anterior and lateral parts of the cavity, were thin and membranous, and of a dark slate colour; but where the effused substance was most abundant, there was a tendency to the formation of small collections of pus. All the fluid part of the effusion from the surface of the peritoneum appeared to have been absorbed. The thin, but dirty and opake fluid which was found in its cavity was evidently derived from the large cyst which formed the tumor which had been observed during life; and its escape, which was obviously recent, probably took place, either in removing the body, or in the first attempts to raise the parietes which were adherent; either of which might have separated the slight adhesions which covered the small ulcerated openings which

perforated the cysts from its internal surface. The omentum, which was thin, and spread over the whole of the anterior part of the abdomen, was slightly adherent both to the parietes and to the viscera : it was of the same slate-colour as the newly-formed adhesions. The peritoneum lining the parietes was thin, and easily detached from the aponeurosis of the muscles.

In the anterior and inferior part of the parietes there was an abscess, which extended, behind the symphysis pubis, into the cellular membrané of the pelvis. It was however circumscribed ; and though tolerably extensive, it was not diffused through this structure. Its internal parietes were of a dark colour, and its contents dirty, with a trace of yellowish brown colour, and very offensive odour ; yet it did not appear to contain fæces, or to communicate with the intestine. The uterus, which was rather large, was pushed obliquely over to the right side: it was considerably distorted. The os tincæ was cleft, and the cervix and round ligaments were twisted together (Preparation 2237ᶜ); and the position of the ovaries and Fallopian tubes, which had contracted adhesions, was so altered, that it was difficult to recognise the spot at which the tumor had commenced. The cyst was unaccompanied by any attempt at the production of others. It contained a thin dirty fluid, mixed with ragged flakes of yellow coagula : it was rendered irregular, internally, by ulceration, and had a few small perforations. The alimentary canal appeared tolerably healthy, except a little dentritic injection in the duodenum. The liver was large ; but towards the scrobiculus cordis it had been compressed by the tumor, which, on the right side, extended almost to the crista of the ileum.

For a plate illustrative of the forms of Compound Serous Cysts, see the Fifteenth Volume of the Medico-Chirurgical Transactions.

With respect to these adventitious structures being supplied with arteries or veins, or both, I may observe, that a careful injection with coloured size has convinced me that they possess, as might be conceived *à priori*, both sets of vessels ; which, for the most part at least, ramify in exact correspondence with, and close approximation to, each other. As to the existence or absence of lymphatic vessels, I have no observations to offer.

LECT. IX.

THE reader is referred to the Fifteenth Volume of the Medico-Chirurgi-
cal Transactions, for plates which may facilitate the comprehension of the
views offered in this Lecture. Some of them are well illustrated in Plates
I. II. III. of Sir Astley Cooper's Work on Diseases of the Breast ; although
the malignant character of the tumors there delineated may be regarded
as doubtful. See also some remarks on tumors possessing the structural
characters under consideration, in a Letter addressed to J. Hilton, in
No. III. of the Guy's Hospital Reports, p. 495.

LECT. X.

FOR a representation of the small cysts occasionally seen in the adipose
membrane in the neighbourhood of a scirrhous tumor, see Sir Astley
Cooper's Work on the Breast, Plate 5. fig. 1. Also a plate in the Medico-
Chirurgical Transactions.

In the Second Number of the Guy's Hospital Reports, the reader may find
some good delineations of sections of uteri containing tubercles in different
stages. They are appended to a paper by my friend Dr. Ashwell, on the
complication of pregnancy with the existence of such tumors. In the same
Number there are also some observations on the structure and progress of
these tubera, which the Doctor has done me the favour of inserting in his
paper. I refer to them, as containing particulars not noticed in the preced-
ing Lectures ; since they rather belong to a Lecture on the uterus espe-
cially, than to the general Lectures on the class of adventitious structures
in which these tubera are included. I also feel called upon here to offer a few
observations respecting some strictures on that paper, in the recent work of
J. T. Ingleby. I have certainly no wish to depreciate the work, which
I have not read, but of which I have received a favourable impression ; and
I would willingly confine my notice of the author's strictures to a private
communication with him, if such a course would not seem like a tacit admis-
sion of their accuracy, and leave the public misinformed. With respect to
the anatomical character or structure of these formations, it is a matter
which admits of ocular demonstration : and as I find that very numerous
observations uniformly confirm the description which I have given, to the

satisfaction of others as well as of myself, I can only suppose that the points
in question escaped the notice of the author ; which may easily happen to
one who is not accustomed to examine these growths in different tissues.
As to the malignity of these formations, conflicting opinions will probably
be drawn from the very same cases. I have fully admitted the general
indolence of these uterine tumors, and assigned a probable reason for it ;
which receives some confirmation from the very exceptions, in which they
undergo precisely the same mode of softening and decay which is common
to other growths of this class. Their very frequent connection with un-
questionably malignant affections in other parts of the body must, I con-
ceive, be generally known and admitted, and, in conjunction with the strict
resemblance in structural character, affords, I conceive, a sufficient reason
for placing them in the same family. The author states, that these tubercles
are sometimes " nearly identified with the proper tissue of the organ," and
are apparently destitute of an encysted structure. I do not deny his accu-
racy in this respect ; although I have never found any thing of the kind, in
a very large number of specimens which I have seen and examined. I hope
he has preserved the specimens to which he has referred ; since I am per-
suaded that they will prove either to be cases of extreme interest and
rarity, or shew that there has been some fallacy in the mode of examina-
tion. The author seems also to doubt that the development of these
tumors is accompanied with an increase in the size of the uterus itself, but
rather considers that it undergoes absorption. I shall be glad to have an
opportunity of shewing him several specimens in which this increase has
taken place, almost to the same extent as in pregnancy. I know that this
increase is not invariably the case ; and that, on the contrary, the substance
of the uterus may be much less than is natural : but I do not pretend to de-
cide whether the tubercle was developed in a very small uterus, or whether
the uterus was reduced after the formation of the tubercle.

Page 289. See a plate in the Medico-Chirurgical Transactions illustra-
ting fungoid disease affecting bone.

Page 291. See a plate representing the gelatinous or gum cancer affect-
ing the pyloric portion of the stomach, in Dr. Carswell's 3d Fascic. Plate I.
fig. 8. There are in the Museum several excellent specimens of this struc-
ture, situated in various parts of the body.

LECT. XI.

SEE, in the Second Part of Dr. Bright's Reports of Medical Cases, Vol. II. Plate XXIV. fig. 3. a representation of the arachnoid lining the dura mater rendered grey by a multitude of minute particles of black matter.

Page 303. See, in the Edinburgh Medical and Surgical Journal, the interesting papers of the late Dr. J. C. Gregory, and of Dr. W. Thomson, on the black colour of the lungs, caused by the inhalation of coal-dust.

The following case appears to be an example of blackening of the lung, in conjunction with alteration of structure resulting from pneumonia.

JOHN MILLER, aged 50, admitted into the Clinical Ward on the 21st of 4th month (April), 1830. He was a stout man; and had for some time been the subject of shortness of breath, and winter cough. He had latterly employed himself in selling hearth-stones. At the time of his admission he was labouring under great difficulty of breathing: his countenance was livid; he had considerable cough, but the expectoration, which had been copious, was greatly diminished. The man's own expression was, " that he had spit up all that he had to spit." His abdomen was swollen with ascites, and his legs with œdema. His urine coagulated on the application of heat. He had a puffy, fluctuating swelling on the left arm: it was the consequence of a blow, but was attended with little or no pain. (See the Clinical Ward Books, 1829-30.) The body was examined on the 29th of 4th month (April), 1830: the face was bloated and livid.

HEAD.—The head was not opened.

CHEST.—Both pleuræ contained serous effusion, but the right by much the larger quantity: the adhesions were old and partial. The surface of both lungs, but especially of the right, was rendered remarkably uneven and irregular, by puckered depressions, and rounded protuberances; with some short bridles of adventitious membrane, stretched across some of the depressions. There was likewise partial thickening of the pleura pulmonalis, giving it whiteness and opacity. The principal depression was about the middle of the lung, laterally. The rounded prominences evidently depended on emphysema, from dilatation of the air-cells; and the depressions were produced by great but partial contraction, with consolidation and induration. The substance of the lung was of a leaden hue; and the puckered indurated portions, when cut into, not merely presented a dark blueish, slate colour, but in some parts broke down under the finger, producing a substance like powdered slate and water. (See Preparation 1729^A.) It had

but little odour, or, at the least, nothing like that of gangrene of the lung; nevertheless, it left a pretty permanent, dark stain, especially on the finger-nails, as is sometimes the case with gangrenous lungs. This state of the lung was probably the result of pneumonia with hepatization, not of the least plastic kind, which had permanently obliterated the air-cells of the affected part. This state occurred on both sides of the chest. The mucous membrane of the trachea and bronchial tubes was of a deep-red colour, thickened and granular. The heart was prodigiously enlarged, particularly the right ventricle, which was thickened as well as dilated.

ABDOMEN.—The abdomen contained a large quantity of serum (perhaps several gallons): it was clear and straw-coloured, and free from flakes of coagulated lymph or false membrane. The omentum was not corrugated; but beautifully extended over the viscera, containing very little fat, and having its layers remarkably distinct, for the age of the person. The mucous membrane of the stomach was rather injected; that of the small intestines tolerably healthy: that of the colon presented the traces of old ulcerations, in the form of narrow and, for the most part, unbroken lines, of a leaden hue, very slightly depressed, having irregular edges, and being little moveable on the subjacent coat: these lines corresponded to the bands of the colon. The intervening mucous membrane was tolerably healthy. The liver presented somewhat of the mottled character, produced by a light colour of the indurated acini, and a deep venous injection of the intervening substance, which concurs not unfrequently with enlarged hearts. The spleen was of moderate size, but turgid, and of dark colour. The kidneys were far advanced in the mottling degeneration.

For some account of the peculiar affections of the absorbent glands, alluded to at p. 322, see a paper by the author, in the 17th Volume of the Medico-Chirurgical Transactions.

LECT. XII.

IN the review which, in this Lecture, I have given of the opinions of different authors who have treated of cancerous affections, I regret that those of Schrœder van der Kolk have not been mentioned. Although that author's work has now been published for several years, it has been little accessible, and little known. From a short notice in the work of my friend Professor Alison, I was desirous of seeing the observations of Schrœder van

der Kolk, and endeavoured to obtain the work containing them ; but having
failed in that attempt, I did not become acquainted with the views of the
Dutch pathologist until the last sheet of these Notes was in the press; when
my attention was called to the elaborate analysis of them, which has been
given by Dr. Craigie in the cxxviith Number of the Edinburgh Medical
and Surgical Journal. To that article I must refer the reader ; and limit
myself to remarking, that although Schrœder van der Kolk has not occu-
pied the same ground which I have taken, some of our views and observa-
tions appear to be in accordance. As respects his distinctions, and the
grounds on which they rest, I feel under the necessity of differing from him ;
as I must also do with regard to some of his opinions on the formation of
new vessels. On the subject of tubercular phthisis which I have prepared
for the Second Volume, I observe a striking similarity between some of the
opinions of Schrœder van der Kolk and those which I have been in the
habit of teaching for years past.

END OF VOL. I.